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1943

Number 9

COMMAND AND GENERAL STAFF SCHOOL

MILITARY REVIEW

MONTHLY REVIEW OF MILITARY LITERATURE

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December 1943

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Some Thoughts on Leadership

MAJOR GENERAL ALEXANDER M. PATCH, *United States Army*

General Patch succeeded General Vandegrift of the Marine Corps in command of operations on Guadalcanal when the Marine Corps, after five months hard fighting, were given a rest. For his efforts in defeating the Japanese forces, General Patch was awarded the Navy's Distinguished Service Medal: "For exceptionally meritorious service in a duty of great responsibility as commanding general, Guadalcanal Area, during operations against enemy Japanese land, naval, and air forces from December 10, 1942, to February 9, 1943."—THE EDITOR.

A NATION committed to combat must have matériel with which to fight and the men to use such equipment. It is unnecessary to discuss the relative merits of these two essentials, for one without the other is valueless.

The equipment of war seems to equalize itself between combatting nations. Let one develop a mortar of new caliber or a field piece of different muzzle velocity and it is only a brief time until his opponent has a similar weapon. Likewise there is a continual race between offensive and defensive weapons. The rocket launcher will stop the tank and the AA is rapidly improving as are the anti-bomber planes. There is only a temporary advantage in any new effective weapon; the advantage lasting until the opponent has built the same weapon or a defensive one to neutralize it. Our troops are proud of the matériel which the highly ingenious and industrialized forces of the nation have given to them. They feel, with confidence, that the weapons with which they fight will always equal if not exceed those of their enemy.

What has been said of the equalization of equipment is likewise true of tactics. The movements of the armies of Napoleon startled the world until an equal in Wellington appeared. In Africa, Rommel was most successful until Alexander and Montgomery displayed their talents. The strategy of von Schlieffen, Lee, von Moltke and all the rest are thoroughly known. There may be a temporary advantage in the application of one form of maneuver over that of another, and should that move come when the opponent is almost prostrate it may well be decisive. But nations cannot afford to risk their very existence on the hope of evolving a new or more effective form of maneuver.

To what, then, may the nation look for success in this and other wars if it is not to equipment and tactics? The answer can be found in a reply made by a general to Peter the Great: "Success in war does not depend upon the number and size of armament; nor upon movement, least of all upon movement. It does depend upon these and these and these," at which he pointed to the men in the ranks. Modern equipment and knowledge of the tactics of by-gone years has not lessened one iota the importance of the role of the individual soldier. He is still the supreme factor of success. Without sterling soldiers, the finest equipment is valueless and the best general in the world is helpless. With individual soldiers well led by zealous officers and fortified with a martial ardor, physical stamina, and a mental determination to fight to the end, a mediocre general and equipment of lesser value will win over a superior force.

The task of converting citizens of a free nation to soldiers for the battlefield is the biggest job of the United States Army. Our people, blessed with the bounties of nature to an unequalled degree, have never adopted a philosophy of aggression which is conducive to a strong military program. In fact, these resources with unbounded facilities for commerce and an absence of nearby geographical belligerents have created an anti-war complex which is overcome only when free intercourse and the American way of life is endangered. Thus from an easy going life of peaceful pursuits we are now required to undergo a quick transition to the tempo of war; a transition which calls for physical hardening, mental readjustment, and the building of morale that will fortify individual soldiers upon the field of battle.

"The inherent worth of the soldier is everything," said Hindenberg. Into his very fiber must be woven the principles for which he fights. No one will deny the ferocity with which the German and Japanese soldier have fought. Their spirit in battle is traceable to the teachings of their leaders. When the *Ecole Militaire Supérieure* in 1877 undertook a study of the German military plan and the causes of their success, they were surprised to learn that it was not a uniform method or a centralized intellectual administration of the German Army, but a philosophy which was a folk possession. On the west were the Dutch, the Belgians, and the French; to the south the Italians and the Balkans; to the east were the Russians and on the north the Scandinavian countries—all of whom were restricting the economic growth and free expansions of the German people. Since the time of von Moltke, the elder, such have been the teachings of the German leaders. It is, therefore, no surprise that twice within one generation the determination to expand the empire has flared in the turmoil of war. The morale, the will to fight—the power that drives the machinery of war—is present in every German and Japanese soldier and it is that which makes them such formidable enemies.

So the events since December 7, 1941, have aligned upon the one side highly disciplined, well trained, organized, experienced armies, indoctrinated with the necessity of expansion for their survival, against a people on the other hand who desire peace, no territorial expansion, and whose very life revolts against regimentation and compulsion. Having been compelled to commit ourselves to combat, it devolves upon us to develop in the shortest period of time an army well organized, superior in discipline, morale, and training to that of our enemies. This in short is the problem of the Army of the United States. It is a challenge of the highest order, and upon the officers of our military forces it places an extremely grave responsibility. Our success over our enemies will depend upon the degree of development of certain essentials of military personnel:

1. Skilful and resolute leadership.
2. A high morale.
3. Well organized and disciplined troops.

If we have the first of these three we are bound to have the last two and it is for the development of those qualities of leadership that I have the temerity to offer my opinions for whatever they are worth. These remarks are addressed particularly to officers of junior grade.

Many times junior officers feel that they have been handicapped by lack of economic position and educational foundation. But upon neither of these two is real leadership dependent. Men of great academic accomplishments are often inclined to vacillate while those of lesser degree are much more aggressive and possess a high degree of initiative. I recall recently having observed the workings of a platoon leader who came from a very wealthy family. It was natural to suppose that he, having enjoyed the luxury of wealth, would expect great difficulty in adjusting himself to a soldier's life. Probably he did, but when I saw him he was sharing with his men every known form of hardship. The finest reports were received from his superior officers, and the soldiers of his platoon would follow him anywhere under any conditions. As contrasted with this man of means, I witnessed a corporal, an Italian boy from the eastern shores of the United States. He had known only the barest of necessity and possessed very little education, but he was a leader of the higher order, respected by men and officers alike.

The foundation of leadership is character. Any young officer who possesses the virtues of character or who is willing to cultivate them will have no trouble in acquiring effective leadership. If he does not possess them and is unwilling to develop them, then the quicker he is removed from command the better will the interests of the military be served. I have observed too long to believe that any man can fail to develop these attributes of character which develop leadership if he will only make up his mind so to do.

The characteristic which higher command always looks for in any officer is honesty. Honesty in thought, word, and deed. No man can dream of becoming a military leader who gives lip service to one God and by action serves another. The officer who will agree with his battalion commander on a certain course of action and quickly thereafter complains to his men and otherwise berates his superior has lost the foundation of leadership. It is true that he will find some officers and some men who will join with him in belittling his commander, but even with these and certainly with the greater majority of his command he has lost respect. Cheerful compliance with the orders of a superior, whether they are to your liking or not, will pay dividends from senior and junior officers and among all of the men of the command.

There is a mistaken idea of many junior officers that being a good scout and sympathizing with the hardships their men must undergo is an indication of leadership. An officer who asks his men to drink with him will find that they are quick to respond, but the next day on the drill field or in garrison, he will learn that they are equally quick to take advantage of that proffered friendship. Discipline is vital for a well trained unit and it cannot be developed through undue familiarity. Furthermore, an officer who has been unduly friendly finds himself embarrassed when he meets a situation where punishment must be applied. It is most difficult to rebuke a man with whom you have been familiar. The other men of the unit will be quick to sense a degree of partiality, and this will lessen the esteem in which they hold the officer. In dealing with men, a junior officer should bear in mind (1) that he must always be courteous but businesslike in his dealings with men; (2) that when they make mistakes, he must correct their faults, but let them know in no uncertain terms that repetition will not be tolerated, and (3) if they are repeated that firm and immediate action will be taken and that there will be no resort to compromise. Such procedures will command respect among the men of any unit whether they like you or not and there is no substitute.

Every officer should realize that in dealing with the men of his command he is dealing with men who have been schooled in the same general philosophy of life as he; therefore, he can expect the same treatment from his men which he, in turn, gives to those who are superior to him. This implies that there must be sincere honesty in every act, tangible and intangible, by the officer if he expects response in kind. He may be able to fool his commanding officer, but he will never be able to fool the men of his unit, and when the men observe an officer displaying a front to a senior and then acting counterwise, they will indeed lose all respect for that individual. As

he reacts towards his superior, so may he expect his men to react to him.

There is no standard treatment for all of the men of a unit. The American soldier is indeed an individualist and each must be handled as such. To one man you may make an appeal; to another, firm discipline must be applied. This requires a thorough study of the attributes and qualities of each, and diligent attention to their individual problems. Such treatment will be readily understood by the men and recognized as generally fair.

An attitude of superiority detracts from the effectiveness of an officer. The insignia which he wears upon his blouse is not a recognition of accomplishment, but rather an indication of responsibility and of the faith that his country has in him. It will be through his examples to his men, his unselfish concern for those under him, that he will be fulfilling the obligation which he should feel.

Second to honesty and courage of purpose, I would place an unselfish attitude as the greatest attribute of a leader. An officer who thinks of his own bedding-roll and the regularity of his meals before the comfort of his men is indeed losing a valuable point in the development of leadership. Place the care and the protection of the men first; share their hardships without complaint and when the real test comes you will find that they possess genuine respect and admiration for you. To do otherwise means failure at the crucial moment when the support of your men is essential to the success of battle, or maybe to the preservation of your own life. I recall once visiting a hospital on Guadalcanal where lay the wounded and sick from jungle fever. I came to the cot of a soldier who had been wounded several days before so badly that you could hardly recognize him as a human being. Before I could ask him how he felt, he raised on his elbows and asked me if his commanding officer was still alive and if he had been wounded. He told me the men of that company would go through anything for that officer. For he never commanded any of them to do anything which he himself would not do. This, indeed, to me was a true tribute to real leadership.

By virtue of the insignia which he wears, the men have a right to expect of an officer more than they themselves possess. An officer loses quality when he addresses his unit upon some subject about which he knows very little. The War Department has provided a system of Service Manuals in which all the answers to military procedures and problems can be found. In the instruction of men of a unit, officers are directed to follow the procedures of these Field Manuals and to tell them what they have learned therefrom. The men have the right to expect, when you are consuming their time and engaging their attention on these subjects, not only to know what the Field Manuals state, but what contemporary publications may emphasize. Do not fail them! Every officer must study incessantly that he might give to his men in the few short hours which are permitted for their training the very utmost that his ability will permit.

I am unalterably opposed to the use of profanity by officers in their official relations with soldiers. While it is trite to say it is lack of vocabulary, it is also indicative of lack of self-control and it is usually used to cover deficiencies.

I would like here to quote a maxim from which I think every officer could learn a valuable lesson: "Be more than you appear to be; do much—say little; let your work speak for you."

Another characteristic of a good leader is always to have a plan. This is true upon the training grounds as well as upon the field of battle. Design the program for the day's work with meticulous care so that each minute challenges both officers and men of the unit. Every officer should have a plan devised for any emergency which might arise. This will tend to create confidence in himself and his men. When an out-door program is suddenly interrupted by inclement weather, a quick transition to in-door training without loss of time and poise by the instructor will breed confidence in the men. When the unit arrives upon the field of battle, have a plan by which any expedient will be met. It may be that the plan which was formulated is not the best under the particular circumstances, but the fact that there was a plan, any plan, will develop great confidence. Men who come under enemy fire for the first time are frightened and frozen into inaction. To say otherwise would be dishonest, but if the officer has explained to his noncommissioned officers a plan which they will follow once the enemy bullets begin to fly, and you carry out this plan, you will find that it may be the difference between panic or command control. A prior plan tends to develop self-control under excitement, and a calm exterior with a matter of fact voice will indeed inspire confidence.

Great military leaders have always possessed undaunted courage. History abounds with stories of leaders who have dared to do those things which their opponents never would dream they would. All young officers should dream of those events which would demand of them courage, fortitude, and personal sacrifice and thereby prepare themselves against the day when they will put into practice that of which they dream.

Strong and resolute leadership will result in a well disciplined Army of the United States. The time to apply it is now, and not after we get on the battlefield. It is not difficult to attain, but can be acquired by all who have the determination to be honest in thoughts, words, and deeds; who have vowed to be impartial in their dealings with men; who possess or have developed self-control; and who have a full appreciation of the responsibilities of their rank.

The Service Commands – Their Organization and Functions

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INTRODUCTION

THE SERVICE Commands and the part they play in our present war effort are unfortunately all too little understood and appreciated in the Army today. To many they are simply the old Corps Areas under a new name, plodding along at the old peacetime pace; and to others whose recent connection with the Army precludes even that associative background, they are merely an accumulation of staff officers who in a vague sort of way have something to do with furnishing supplies and services to the tactical units.

It is the purpose of this article to consider the Service Commands, their organization and functions in an effort to present, if only in a general way, a clearer picture of the important influence they exert on all branches and activities of the Army.

To understand their functions, however, it is necessary to know something of their origin.

The National Defense Act of 1920 provided that, "For purposes of administration, training, and tactical control, the continental areas of the United States shall be divided on a basis of military population into corps areas."

As a result of this legislation, the continental United States, including Alaska, was divided into nine Corps Areas replacing the six territorial departments which had formerly existed. The states within those nine Corps Areas, or Service Commands as they are now called, have been subject to adjustment and change from time to time in order to obviate "difficulties in supply administration and control."

It should also be noted that a tenth and eleventh Service Command have recently been established. The tenth is the Military District of Washington, and the eleventh is the Northwest Service Command which contains all activities of the Army of the United States in the provinces of British Columbia and Alberta, the territories of Yukon and Mackenzie, Canada, together with the operation and construction activities connected with the White Pass and Yukon Railroad, the highway from Whitehorse to Fairbanks Alaska (the Alaska Military Highway), and such base installations as may be necessary in Fairbanks. The New Haines—Whitehorse—Fairbanks highway is also one of the Northwest Service Command's activities.

The original conception of a Corps Area was an echelon in the chain of command capable of providing the nucleus for a wartime corps, and it was contemplated that the Corps Areas would be organized into three Army Areas of three Corps Areas each. The general duties of the Corps Area commander included the command of all Army personnel within the Corps Area except exempted stations and except for tactical command when such personnel were assembled for training or for operations by corps, GHQ air force, army, or higher commander. The Corps Area commander was made responsible for supervision of all civilian component training, troop training and supply, care of fortification material, and preparation of plans to meet domestic emergencies.

It was also provided that in the event of mobilization, tactical command would pass from the Corps Area commanders to tactical unit commanders as directed by the War Department.

In the fall of 1940 the training and control of units of the field forces pursuant to this regulation were separated from Corps Area commands, and with the activation of Army Headquarters and the grouping of divisions into corps and corps into armies, the Corps Areas were divested of all control over the field forces except for matters pertaining to administration, supply, housing, and other related operations.

By the War Department reorganization of 9 March 1942 the Corps Areas were consolidated, together with certain other administrative services of the War Department, such as the supply arms and services, general depots, ports of embarkation, etc., under the jurisdiction of the Commanding General, Army Service Forces, and in effect the Corps Area thus became a field agency of the ASF, an administrative echelon intermediate to the Headquarters, ASF, and the continental posts, camps, and stations which directly serve the troops of our Army. And to complete the transition and to eliminate the tactical flavor of these administrative agencies, the title "Service Command" was substituted for "Corps Area" in July 1942.

The mere regrouping of these commands as part of the ASF and the change in their nomenclature did not, however, of themselves simplify operations. Representing as they did for the period from 1920 to 1942 the principal territorial subdivisions of military population, and at the same time and for almost the same period, the most important echelon in the command channel, they were affected by nearly 90% of every Regulation, Circular, General Order, and Bulletin. Each of these either imposed some new duty on the Corps Area or defined some duty already charged to it. Freedom of action and initiative was stifled by the fear that no matter how many regulations one inspected before he acted there

would probably be some other with which his action might conflict. The ordinary discretion allowed to the average business executive in his everyday operations was entirely stifled by the mass of rules and regulations which guided Corps Area staffs. That such is not to be the case in the future you have the word of General Brehon H. Somervell, Commanding General of the ASF.

In the recent conferences attended by General Somervell and many of his staff, the Commanding Generals of each of the Service Commands, and representatives of the Ground and Air Forces, General Somervell pointed out that the tempo of our present operations not only does not permit but absolutely forbids the procrastination and delay which a too rigid adherence to custom and regulation encourages. Rules and regulations will not be laid down to cover each situation. The principal desire is to get the job done, regulations and precedents, if need be, be damned. That is not an invitation to ride roughshod over all rules, but the Service Command cannot wait for an official ruling before it takes action. To achieve this result, it is the policy of the ASF to establish a minimum number of general directives to guide Service Commanders and then to decentralize to them the actual execution of those directives. The Service Commander is told in general what is to be done; but how it is to be done is left to his own decision, and he will be expected, in turn, to decentralize wherever possible to his staff and his post and district commanders again under general policies announced by him.

This system has worked, and the Commanding General of the Army Service Forces was determined it had to work. The answer, of course, is proper personnel—men who can be trusted to make decisions soundly and promptly, even if there is no precedent to justify the action.

The ASF, with the Service Commands as its field agents, is a business organization. The Air Forces and the Ground Forces are primarily charged with the duty of organizing, training, and preparing combat units. The job of the ASF is to relieve those combat units of the administrative and business details which, while necessary to their continued success, are entirely unrelated to any training program they may have or they may plan, looking forward to the development of their combat efficiency.

The Mission of the Service Command

The eleven Service Commands are the agencies which represent the Commanding General of the ASF within their respective territorial spheres of operation. They carry out the policies laid down by the Commanding General of the ASF and they relieve combat units within their area from those business and administrative details. It is true, of course, that the Service Commands do have certain training and, in a sense, tactical missions—training in so far as the Service Command units themselves are concerned and tactical in so far as internal security within the Service Commands is concerned—but their big task, to indulge in a very practical analogy, is to act as a city manager for all of the combat units within their territorial limits, to house, supply, and maintain utilities for those combat units so that they can devote themselves to their primary task—the training and development of a combat mission.

Scope of Authority of Service Commands

The scope of authority of the Corps Area commander in the past was difficult of definition. It was not unusual to find in one Corps Area, yes, even on one post, certain activities partly responsible to the Corps Area commander, partly responsible to a tactical or army commander, and partly responsible to one or more chiefs of branches such as the Chief of Ordnance, Chief of Chemical Warfare, etc.

As now set up, it is true there are still certain exempted activities; but they have been minimized and grouped so that the extent and scope of a Service Commander's authority is now clearly outlined. All installations with which Service Commands are concerned may be divided into five categories. *First*, installations under the complete command of the Service Commander. These include the Service Command Headquarters; recruiting and military personnel procurement stations; induction centers; reception centers; general dispensaries; and ASF replacement training centers, unit training centers, and schools (except when placed under chiefs of branches), with the exception of training doctrines and the assignment of training personnel which are specifically retained by the Commanding General, ASF. This is a small but representative list of those agencies and installations which are under the complete command of the Service Commander, and he is responsible not only for the administrative and supply duties and the handling of overhead operations but he is also the direct commander charged with their training and their complete operation. (For complete list see AR 170-10.)

The *second* class of installations is under the command of the Service Commander for such matters as administration and supply; but he has no control over those agencies nor authority in connection with the command or training of troops located thereat. These are the posts and stations throughout the Service Command which are used to house and train units of the Army Ground Forces or Army Ground Force Training Centers and Replacement Training Centers. As to those posts, the Service Commander is in reality nothing more than a city manager charged with furnishing overhead personnel or station complements to keep up and maintain the post and facilities thereat for the use of Ground Force units, but without any control over their training and without in any sense commanding those troops.

In the *third* classification are those installations under the command of the Army Air Forces. Without going into detail (and there are some real distinctions) the Service Commander's responsibility is somewhat similar to that at installations which house units of the ASF administrative and technical services.

The *fourth* class of installations includes those which are under the command of an administrative or supply service of the ASF and which, because of their technical nature (ordnance depots, manufacturing arsenals, proving grounds, etc.), should and must operate directly under the supervision and command of the Chief of Ordnance, Chief of Chemical Warfare, etc. The duties of the Service Commander at those posts again is limited to certain specified administrative activities.

Then there is a *fifth* class the components of which have been called special installations such as the United States Military Academy. In each of these installations, however, the Service Commander does retain certain limited administrative duties.

All of these classes are cogently defined and listed in the ASF Organization Manual, section 402.02, and in AR 170-10, paragraph 6.

Organization Headquarters of the Service Command

To assist the Service Commander in discharging his duties as field agent and representative of the Commanding General, ASF, a complete Service Command Staff is provided.

The ASF Organization Manual is the basic handbook of the Service Commands. It defines their responsibility in the War Department scheme, and it sets up an organizational chart for their operation. This chart, however, is not so inflexible below the staff division line as to forbid departure or deviation; and the Commanding General of the ASF has declared himself in favor of such departures if and when the Service Commander feels that he can carry out his work and discharge his duties under some other organizational system more suitable to the peculiar problems confronting his Service Command Staff.

In the Service Command the military titles, G-1, G-2, G-3, and G-4 have been eliminated and in place of them we have staff officers described as directors of staff divisions. This again is in keeping with the idea that a Service Command is not a tactical organization. It is a business organization, and it is conceivable that the ASF might have gone all of the way and instead of calling these staff officers directors of divisions, might have called them vice-presidents in charge of production, supply, personnel, etc.

At the very top of the chart is shown the Commanding General, the one primarily responsible that the mission of the Service Command is achieved. Assisting him is a complete staff organized in seven principal divisions with a director in charge of each division. In addition to these principal divisions there are five separate sections, the Inspector General, Public Relations Branch, Control Division, Air Liaison Officer, and Labor Branch. Below the Commanding General is the Chief of Staff who is not solely a coordinating staff officer as is the case of the Chief of Staff in a tactical organization, but who is in fact the man who acts for the Commanding General in his absence—more as a deputy or a senior vice-president.

The five sections are set up as such because their activities are so closely the concern of the Commanding General that they operate directly under him rather than through a Staff Division.

a. Control Division.—One of the most important of these sections is the control division. Many unpopular names have been applied to this division and to the officer who heads it, most of which, however, are unfair appellatives. He is neither a hatchetman nor an efficiency expert. The control division helps the General to plan, and to evaluate the effectiveness with which plans are executed. He is a minister without portfolio, the only real non-operating staff officer of the Service Command Headquarters. His job is to get out in the field and among the various divisions of the Service Command Headquarters as the General's personal eyes and ears, to find out not only why some division or post or agency of the command is not operating properly but more often to find out why some division or agency is working so well, in order that the technique of operation of that agency can be analyzed and passed on to other agencies. The control officer does not command; he visits the posts and the staff of the headquarters to find out how conditions can be improved, how procedures can be simplified, and how the tempo of business can be accelerated. Many problems can be solved by a simple conference between the control officer and the director of the division, the post commander, or the other agency head. If, as a result of the conference, it develops that some policy of the General is inappropriate, the control officer reports that back to the General and recommends a change. He might better be described as an Internal Liaison Officer with whom all can discuss, and receive advice upon, their own individual problems of operation.

b. The Public Relations Branch.—This branch, as its name implies, is responsible for all public relations, press releases, radio releases, and contacts with civilian activities involving Service Command publicity. It does not usurp or enter upon the public relations activities of tactical units within the geographic limits of the Service Command, although it will work closely with them.

c. The Inspector General Branch.—This too is a branch which operates closely under the Command-

ing General. It performs the same functions as the former Inspector General on the Corps Area staff and also maintains very close liaison with the Army Inspector General, making inspections and inquiries for him when requested to do so.

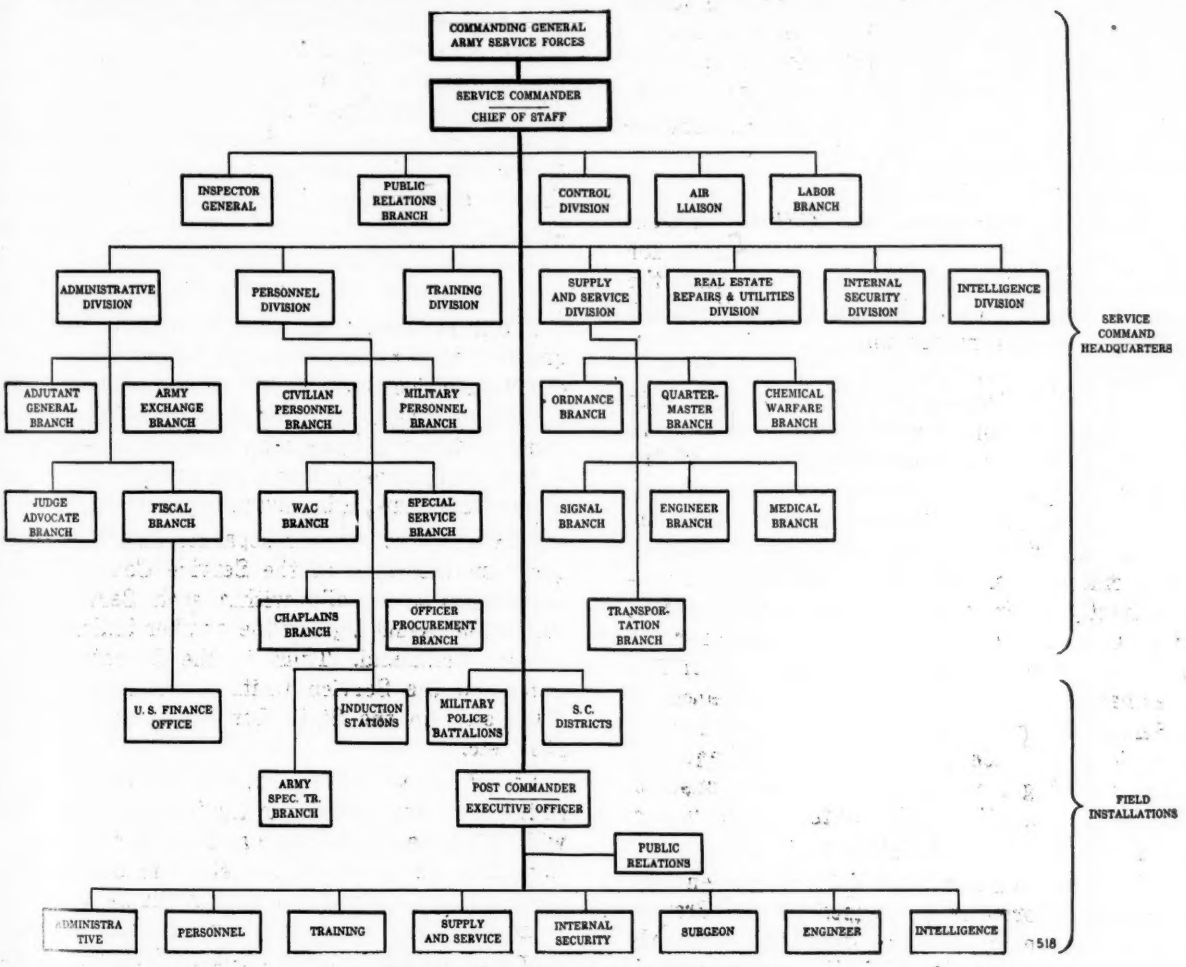
d. The Air Liaison Officer is a special officer on the General's Staff who advises and coordinates on matters relating to the Air Force units within the Service Command.

e. The Labor Branch.—This section exercises staff supervision over all labor supply and labor relations activities with respect to private employers who hold War Department contracts and whose establishments are located within the Service Command, and also coordinates all labor activities to insure uniform action on the part of War Department procurement agencies.

Now we come to the principal subdivisions of the Service Command staff—the seven operating divisions.

a. The Personnel Division.—All matters of personnel are grouped together in the Personnal Division. It is the staff section charged with the supervision of the procurement, classification, assignment, training, and promotion of all civilian and military personnel in the Service Command. It also handles all matters relating to morale and welfare and hence we find the Special Services Branch and the Chaplains' Branch as subdivisions of this Personnel Division. Included in this division is also the Army Specialized Training Branch which negotiates and supervises the execution of contracts with schools giving academic training to military personnel.

b. The Administrative Division is that division charged with internal administration within the command. As the housekeeping unit of the Service Command, it provides administrative and office services for the headquarters, operates the message center, and looks after the internal operation of the headquarters. Subdivisions of this division are the Adjutant General's Branch, the Army Exchange Branch, the Fiscal Branch, and the Judge Advocate Branch. The Judge Advocate Branch, of course, furnishes legal advice to the Commanding General and to others of the staff. The Fiscal Branch supervises all matters relating to the expenditure of funds, advises the Commanding General on technical finance matters, and supervises Service Command disbursements. Under the Fiscal Branch are the United



SERVICE COMMAND ORGANIZATION CHART.

States Finance Offices. These are the various disbursing offices throughout the country which are now directly under the Service Commander who is charged with their operation, administration, and training.

c. The Training Division supervises all matters pertaining to training of units of the Service Command. Principal operations of this division consist of operating schools for Service Command personnel and service units of the Service Command.

d. The Supply and Service Division is charged with all matters relating to supply and to the supervision of supply activities in the Service Command. This, of course, is one of the principal operations of the Service Command and includes the supervision of newly activated units and units ordered moved to ports of embarkation for overseas duty.

This division also includes the Transportation Branch whose activities were formerly operated by the Quartermaster Corps.

e. The Real Estate Repairs and Utilities Division is that section of the staff which is responsible for the maintenance of the physical facilities within the Service Command. Under the old system the Chief of Engineers was responsible for utility, maintenance, and new construction, and the Corps Area commander was given certain responsibilities as to supervision, but with his operations limited to mere coordination with the local representative of the Chief of Engineers. This provided a source of constant friction and ineffectiveness. This has now been changed, and Division Engineers are now assigned as staff officers of each Service Commander, responsible directly to him on all matters of maintenance, and leasing and acquisition of real estate for the Service Command. In this respect the Division Engineer has a dual capacity. He is the staff officer of the Service Commander in matters of maintenance, and he is also the local representative and agent of the Chief of Engineers on matters of new construction and the operation and maintenance of waterways throughout the United States.

f. The Internal Security Division has taken over the functions formerly performed by the Provost Marshal and many of the functions formerly handled by the G-3 Section. This division is responsible for all matters relating to internal security, the formulation of disaster plans, counter-fifth column plans, and other matters relating to the internal security of the command.

g. The Intelligence Division is the former G-2 Section shorn of its public relations activities.

Service Command Personnel and Station Complements

All of the Service Command Headquarters are organized along the general lines just mentioned. But, as can be readily appreciated, such organizations are of themselves ineffective without efficient and aggressive lower echelons in the field to carry out the plans and policies of those Headquarters. The principal field agencies of the Service Commander are the respective posts, camps, and stations throughout the Service Command which actually house the troops of the Army during their training and development stages. It is well, therefore, to consider the personnel of the Service Command and the station complements which staff and operate the "chain of hotels" throughout the Commands.

In its broadest sense, the Service Command includes all personnel assigned to the Service Command Headquarters and the several posts, camps, and stations throughout the Command who are not attached to tactical units, and who function as operating agencies of the Commanding General of the ASF. Thus, the Service Command includes the Commanding General of the Service Command himself at the top of the command pyramid and runs all the way down through his staff and the personnel at his headquarters, to include the basic private assigned, say, to drive an administrative truck for the Post Engineer at some outlying post.

The term "Service Command" includes the Headquarters Staff and special installations operated under the Service Commander, such as Ordnance Automotive Shops, Recruiting Stations, United States Finance Offices, etc., and all those troops permanently stationed at posts, camps, and stations to perform Service Command administrative and supply tasks.

Service Units are the separate sub-units which carry on the work of the Service Command, and are numbered serially within each Service Command, the second digit of the number indicating the Service Command. Thus, in the Seventh Service Command the Service Units are numbered 1700, 1701, etc.; in the Sixth Service Command, 1600, 1601, etc.

The purposes and objectives of the Service Units as the operating agencies of the Service Commander will, of course, be the same as those for the Service Command as a whole: namely, the operation of posts, camps, and stations within the Service Command and the furnishing of an administrative and supply service separate and distinct from the tactical or using troops.

The Service Command personnel assigned to each post or station throughout the Command, as the overhead detachment, is called collectively the Station Complement of that post.

As defined by the War Department, a Station Complement is "the minimum adequate personnel for the operation and maintenance of posts, camps, or stations when all units of the field forces are absent therefrom." However, when field force units are present on the post, the additional personnel required for the increased guard, fatigue, and operation of

utilities and installations will be furnished by detail or special duty from field force units to augment the permanent Station Complement. A proviso is inserted that such special duty will be so limited as not to interfere with their training; and when the tactical unit leaves the post for maneuvers or for any other reason, these men will be relieved from duty with the Station Complement and will rejoin their units.

There has been, in the past, considerable misunderstanding about the relationship between field force units and Station Complements, particularly as to the extent of overhead services which a Station Complement can be expected to perform.

A recent ASF Memorandum leaves no room for doubt as to the mutual relations between the Station Complements and the tactical units:

"Apparently the function of Station Complements is misunderstood by many. To provide Station Complements of the size necessary to accomplish all overhead duties on posts would necessitate a material reduction in the numbers available for assignment to the field forces. Therefore, the strength of permanent Station Complements is limited to that necessary for the operation and maintenance of the post when all units of the field forces are absent therefrom.

"The presence of field force units creates requirements for additional personnel for such duties as guard, fatigue, and the operation of utilities. All of these are functions that the units perform for themselves when away from a post, and they are not relieved of such responsibilities by being stationed at a place where a limited Station Complement is provided. The requirements for housekeeping [administrative and supply operations] and related functions that must be performed by field force personnel will be determined by mutual agreement between the senior tactical commander and the post commander, and the personnel will be selected so as to cause minimum interference with combat units. Field force units must consider themselves as self-sufficient units and will not, by their mere presence on post, demand or expect services that would not otherwise be available to them. Personnel of the field forces will not be placed on permanent special duties of a character that will prevent them from accompanying their unit when it leaves the post on maneuvers or for any other reason."

Coordination With Field Units

The separation of activities at one post between the Station Complement and the separate tactical units may well involve considerable overlapping of spheres of operation. To avoid friction and attain perfect coordination requires a high quality of tact, diplomacy, and cooperation on the part of all concerned, and particularly on the part of the post commander and his staff. This can prove a delicate problem at times, in view of the fact that at many posts the post commander responsible for Station Complement activities will be considerably junior to the tactical commander—certainly at divisional posts. It has been found, however, that as a general rule the cooperation of all concerned has been rendered wholeheartedly and the system of separation of activities has been amply justified.

Conclusion

The whole Service Command and Station Complements in particular play a vital part in the successful attainment of our military objectives. The fact that they are charged with non-combat, non-glamorous, routine duties in the comparative safety of continental posts in no way militates against the tremendous responsibility imposed upon them. Upon their shoulders rests squarely the job of so functioning that training and combat development of the field forces will go on unimpeded. "Unless these officers and men perform their missions with conspicuous efficiency the efforts of the field force will be seriously hampered. The opportunities for service and for advancement in the Army are in no way limited by the task which any officer or man is currently performing, except as to the manner of that performance."

Probably no better summary of the principles of Service Command operations can be found than in Lieutenant General Brehon Somervell's foreword to the Service Command Organization Manual:

"It must be remembered that organization alone will not achieve the results demanded of Service Commands in this war. The best available man must be selected for each major job and must be given full authority and responsibility for its performance. Service Commanders must be ruthless in relieving men who do not produce efficient and prompt results.

"Unless recruits are properly classified and assigned, the tactical and training units which receive them are hampered in the execution of their missions.

"Unless troops in training are quickly and completely equipped, the training programs are impeded.

"Unless troops destined for oversea duty are completely equipped and expeditiously transported, strategical plans will be upset.

"Unless field commanders are relieved from responsibility for administrative detail, they cannot give their full attention to their troops.

"Unless the functions of internal security and intelligence are efficiently handled within the zone of the interior, the safety of the country is endangered.

"Above all there must be an all-pervading and unswerving resolve to execute successfully the grave duties and responsibilities imposed upon us by this war regardless of personal sacrifices and hours of work. No mere reorganization can accomplish this. Service Commanders must instill this resolve into each of their subordinates by personal example and by exercising to the utmost, with aggressiveness and a cold disregard for anachronistic precedents, the authority delegated to them to accomplish their mission."

World Air Survey

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IN THE present global war, the Air Forces are demonstrating slowly but surely that the destruction of an enemy's means of conducting a war and the blockading of his lines of communications are the shortest roads to success. This scheme of maneuver guarantees, also, the minimum loss of life to a nation. The bombing operations against German-occupied Europe have been highly successful. Whether or not air power can bring Germany to her knees has not been determined, but it is quite evident that without the air operations German-occupied Europe can never be invaded.

The British are conducting bombing operations at night and the United States Army Air Forces are conducting bombing operations during the daylight, the result being that Germany is receiving bombing on the "round-the-clock" basis. The bombing is being conducted against the heart of Germany's industrial areas, and also against locomotives, canal locks, barges, and other types of transportation in western Germany, northern France, and the Low Countries.

Let us take a look at the results of some of these bombing operations in the European theater.

Essen.—The attacks against the Krupp Works last spring damaged two-thirds of the 200 separate buildings in the 270 acres of built-up area. It is estimated that the damage to the truck assembly shop and the locomotive shop resulted in the loss of production of 750 to 1,000 military trucks and between 100 and 150 locomotives. The housing problem in Essen became acute because of so many homes having been destroyed. An Essen newspaper estimated shortly after the bombing that five months would be required to build needed emergency housing and that 10,000 people in Essen were homeless.

Then again, on 25 July, the Krupp Works were hit, with severe damage to the works and the city. About three-fourths of the town has been destroyed.

Lorient.—Neutral observers returning from Lorient state that almost the entire town was destroyed by 15 April. The Lorient submarine base has not been destroyed, probably due to the fact that it is deeply imbedded in cement, but it is stated that it is probably operating at 20% efficiency because of lack of electricity and other utilities.

Düsseldorf.—The Ruhr Valley in which Düsseldorf is located has been one of the principal targets for air attack. Düsseldorf being the administrative capital of the Ruhr Valley and an important railway center has been a very productive target. Photographs taken after the raid of 11 June show that 1,000 acres in Düsseldorf were devastated. Factories making guns, shells, torpedoes, submarine mine cases, etc., have been damaged. Recent reports show that 75% of the city has been destroyed, 80% of the people have been made homeless, and 25,000 have been killed.

Emden.—According to photographs, 60% of the town of Emden and dock areas have been destroyed.

Bremen.—The Focke-Wulf factory at Bremen has been badly damaged, causing a loss in production of Focke-Wulf fighters. Germany already being short of fighters, it is obvious that this target was of utmost importance. There have been several raids on Bremen and nearly a fifth of the town has been destroyed as a result of these raids.

Lubeck.—Over 40% of the town of Lubeck has been destroyed. Many factories have suffered destruction or damage in this city.

Rostock.—Over 70% of the town of Rostock has been completely destroyed.

Kiel.—The raid on 14 May destroyed or affected almost every building in the Germania Yards which builds 750- and 1,600-ton submarines and Norvik Class Destroyers.

Lee Creusot.—Three hundred Royal Air Force bombers dropped over 700 tons on the Schnieder Works at Lee Creusot (170 miles south of Paris). A Paris radio report stated that the munitions works was nothing but a mountain of debris with 184 persons killed and more than 15,000 persons homeless. The destruction of these munitions works was equivalent to the destruction of three to four armored divisions.

Hamburg.—A final evaluation of photographs taken after the late July and early August attacks shows thousands of acres on which all buildings are ruined. Over three-fourths of the built-up areas are affected. The four main shipyards are damaged. It is reported that fifteen to twenty thousand people have been killed and 350,000 people made homeless.

Oberhausen.—The railway shops have been more than half destroyed.

Cologne.—Sixty percent of Cologne has been devastated with 80% of the central city destroyed. Nine factories have been destroyed and six others almost totally destroyed. Railway property has been heavily damaged.

Vegesack.—On 18 March the submarine yard was damaged so badly that it will be of no value to Germany for about twelve months.

Marienburg.—The Focke-Wulf factory at Marienburg in East Prussia was completely destroyed in the raid on 9 October. This factory is believed to account for about one-half of the Focke-Wulf fighter assemblage in Germany.

Berlin.—Residential and commercial damage is widespread in Berlin. On 3 September enemy roads leading to Berlin were packed with refugees. About 250,000 people fled the city in addition to the 500,000 temporarily living in the country outside of Berlin. Thousands of forged ration cards have been dropped by the Allies, and the Nazis have made it a death penalty for anyone to use them. Riots have occurred.

Air analysts state that it will take about thirty-five major raids by the United Air Forces to destroy Berlin. This figure is based upon an equation established after more than a year of heavy raids which states that one ton of bombs must be dropped for every sixty inhabitants to remove a city from effective war production for many months. However, ten major raids concentrated in fifteen or sixteen nights, as the United Air Forces are well able to do if the weather permits, probably would result in such confusion and destruction that the war effort of the Reich capital would be brought almost to a halt.

Friedrichshafen.—On 20 June a strong force of Lancasters bombed Friedrichshafen, Germany, then flew on to an Allied base in Africa. After two nights of rest there, the Lancasters returned to England via the Italian naval base at Spezia, Italy, to bomb it.

Leaflets are being dropped by the Allies for propaganda purposes. Almost every night, hundreds of bombers are sent out to bomb enemy targets. Other planes drop leaflets in German-occupied Europe. The first three months of this year, forty-three million leaflets were dropped over France; twenty-seven million over Germany. These leaflets analyze the war as it is on the Eastern front, and in general they try to tell the German people what the truth is—and of course they take every opportunity to put in a few blows against Hitler.

The bombing is affecting health and morale in Germany considerably. Reliable reports of German civilian morale describe a growing unrest among the people of towns which have been heavily hit.

It is evident that German propagandists are becoming increasingly concerned over the effect of the Allied air offensive on German morale. One German newspaper made this statement: "What weighs upon us is the fact that we have not the means of preventing such cruelties. We must simply admit that the war has taken a turn into atrocities that we had not foreseen."

The number of German fighters has increased in the west from 700 in January to over 1,570 in October. The increase is due partly to the creation of new units, and partly to units drawn from other fronts. It is clear that the German Air Force now has as its primary mission to defend Germany against the devastating air attacks being made by the Allied Air Force.

German propaganda on this subject is now centered around four main arguments. First, Britain is responsible for initiating the bombing of civilian populations and their cultural treasures. Second, German morale cannot be broken by terror raids. Third, Allied raiders are suffering crippling losses. Fourth, Germany will retaliate against terror with counter-terror. The propaganda in Germany seems to lean toward exaggerating the damage done to Germany's western industrial cities. Apparently they hope to anger the German people and to harden them for the more serious reverses which will be in store for them.

Since the raid on Cologne the night of 28 June, German propagandists have concentrated their best efforts on the destruction of the Cologne cathedral. There was actually a little roof damage done to the cathedral. However, it makes a good basis for German propaganda toward the thought that the Allied aerial assault against "European cultural monuments" serves to link the Anglo-American gangsters with Soviet barbarians. The German people are repeatedly assured that German industries have not been affected by these aerial raids.

What is going to be the result of all this bombing of German-occupied Europe? The result cannot be determined yet. It is fairly evident that without this bombing there can be no invasion by ground forces of German-occupied Europe—at least there can be no invasion without a tremendous loss of personnel. The invasion can be made with much smaller loss of personnel after the German military machine has been weakened by this continuous bombing.

The bombing of German-occupied Europe is divided into four phases, the first phase being the bombing of enemy fighter airfields not very far into Europe; the second being the phase in which attacks penetrated deeper for the purpose of gaining air superiority. The third phase is the phase in which the heart of the enemy's industrial war machine is bombed. The bombing of German-occupied Europe can be considered in the third phase now. In the fourth phase, the air will paralyze the production and movement of enemy war supplies and support the ground forces making a landing.

American fliers prepared and supported the invasion of Italy by flying 17,046 offensive sorties and dropping 15,338 tons of bombs. They destroyed 544 enemy planes and probably destroyed 119, with a loss of 187 American aircraft. The air effort was divided into four phases:

1st Phase—occurred two weeks before the landing. Enemy communications and airdromes were bombed.

2d Phase—occurred between Sept 9 and 11 while the Fifth Army landed at Salerno. During this period the entire Tactical Air Force was employed directly in support of the ground troops.

3d Phase—occurred Sept 12 to 15. The ground forces were supported by reducing the enemy's power to reinforce and counterattack.

4th Phase—air harassed the enemy's withdrawal.

In the longest raid ever made by U. S. bombers based in the Middle East, a large force of B-24's flew 2,500 miles to drop 365,000 pounds of bombs on the huge Messerschmitt fighter plane factory 27 miles from Vienna. Pilots said that as they approached their target they flew through heavy cloud formations and were fearful that they would be unable to see their objective. But right over the factory a great hole opened in the clouds revealing the target clearly etched by bright sunlight against the green countryside below. All planes returned safely.

On 1 August 1943 the Ninth U. S. Air Force attacked the oil refineries in the Ploesti area of Rumania. The attack was made at minimum altitude by a large force of B-24 bombers.

Over ninety percent of Rumania's refinery capacity was attacked. Seventy-five percent of that attacked was knocked out for a period of one month and 46% was knocked out for a period of six months. It is known that oil in storage tanks was destroyed, but it is not known how much except that the loss was heavy.

Air power caused the fall of Pantelleria. The tempo of the bombardment of Pantelleria mounted until on 10 June when nearly 1800 sorties were flown against the island and nearly 2,000 tons of bombs were dropped. The next morning, before a single Allied soldier had set foot on the island, a white cross of surrender appeared on the airfield. Small forces of destroyers and cruisers had shelled the shore installations on six occasions, but the main body of attack had been delivered by air power.

Some people question why Pantelleria fell so quickly while Malta had endured three years of Axis air attacks. Perhaps the principal reason is the fact that the Axis air attacks on Malta were sporadic and bombing was inaccurate, whereas the Allied attack on Pantelleria was one of the heaviest concentrations in the history of warfare and was continuous, with hits on military targets being scored with mathematical precision.

Aircraft are playing an important role in the Pacific theaters. Troops in the New Guinea and the Solomon Islands campaigns could not have lived if it had not been for air support. Supplies and personnel were flown to the battlefields and casualties were evacuated on the return trip.

Over 5,000 troops and over 80% of the supplies were transported to the Buna battlefield by air. Over 90% of the casualties were evacuated by air.

Were it not for the Air Forces it is possible that Australia would have been invaded long ago.

Some of the outstanding events in the Pacific theaters are the battles of the Coral Sea, Midway, and the Bismarck Sea. These battles were in each case between airplanes and surface vessels in which the issue was decided without surface vessels exchanging a shot.

The results of the Bismarck Sea battle are as follows:

	Enemy	*Friendly*
Ships sunk	18	0
Ships damaged	2	0
Aircraft destroyed	74	4
Personnel lost	15,000	13

One of the greatest air battles of the Pacific war occurred over Guadalcanal, resulting in an overwhelming victory for the American fliers. An estimated 60 bombers and 60 fighters were intercepted by our fliers; 32 bombers and 45 Zero fighters were shot down. Later reports show that an additional 17 were shot down by AA. Our losses were six planes; however, two pilots were saved. Three cargo vessels were sunk and a landing barge was damaged.

It is interesting to note that one of the war weapons in which the Japs take particular pride, failed them in the Guadalcanal air battle, just as it failed them in the Bismarck Sea fight. For years the Japs have plumed themselves on their scientific weather forecasting. In the attack on Guadalcanal, the enemy planes approached under a screen of thick weather which supposedly extended south of the island; however, when they reached the Skylark Channel, the sky was cloudless and the American planes from Henderson Field were already in the air to meet them.

The attack on Rabaul on 12 October destroyed 177 Japanese aircraft and either destroyed or seriously damaged 100 surface vessels.

Japanese apparently are quite concerned over their airplane losses, as it has been announced in Japan that production of machine tools for aircraft production has been given top priority. Also, possibly Japan is concerned about the air offensive which we will conduct against them next summer.

It is reported that nine-tenths of the enemy's military facilities in Burma have been damaged by Allied air attacks. This is an achievement, considering that the average attack was made by only twelve airplanes. The Air Forces' increasing pace has hampered the movement of Japanese supplies and reinforcements. Shipping at Rangoon has been disrupted to such an extent that supplies entering that primary point are far below the level required to maintain the Japanese properly in Burma.

The Japanese have been using a new Zero fighter aircraft in lieu of bombers to attack the Allied airdromes in China. During August the Japanese definitely lost 125 and probably 38 more in these attacks. The new Zero fighter is called "Hap." In contrast to

the old "Oscar," the "Hap" has a higher operating ceiling and better diving tactics, permitting almost vertical attacks. The "Hap" armament includes a 20-mm cannon and a 13-mm gun with a new high-explosive bullet—but the "Hap" disintegrates easier than the "Oscar" when hit.

Recently, five divisions of infantry combat units have been formed from the Luftwaffe personnel. This is an indication that Germany is getting short of aircraft. Germany's production facilities have been so hurt by our bombing that she is able to produce about 1500 planes a month, of which quite a large percentage are fighters. The reason for the large percentage of fighters is the fact that the German Air Force has gone from the offensive to the defensive.

In conclusion, it may be stated that the appliance of air power against German-occupied Europe thus far has

Reduced the manufacturing capacity of Germany by at least 35%.

Reduced the power of the German Air Force.

Reduced the efforts of the German military machine on the Russian front, thus making it easier for the Russians.

Reduced the efforts of the German military machine on the Mediterranean front.

Reduced the U-boat production, thus reducing ship sinkings.

Caused 1,800,000 persons to be evicted from their homes in Germany.

Caused the people to lose full confidence in the German political and military machine, thus reducing the will of the people to carry on the war.

Fire as a Weapon of War

A RUSSIAN VILLAGE IN FLAMES. (From *Die Wehrmacht* 4 August 1943.)

THE BURNING of Moscow in the year 1812 may be considered a unique occurrence in magnitude and significance. It may also, however, be regarded as a symbol of the manner in which the Russians wage war in their own country with no regard for consequences. As they retreat, the Russians burn villages and cities over great areas with no consideration for the sufferings of the inhabitants. Their idea is to deprive the pursuing enemy of every opportunity to obtain either shelter or food from the facilities of the country, to cause him to succumb in the vastness and desolation of the eastern areas, and above all to expose him to the severe Russian winter.

This use of fire as a means of waging war is especially destructive because of the wood construction which is so widespread in the east. But its use is also extended to installations serving traffic, especially bridges. In no other theater of operations have our forces encountered so many burned or burning bridges as in the eastern theater. [From an article by Colonel Rossmann, German Army, in *Vierteljahreshefte für Pioniere*, No. 1, 1943.]

Order of Battle

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SOMEONE once said, "There is nothing new under the sun." This might well apply to order of battle. It is not new in the military. We know Napoleon established his enemy's order of battle before he attacked, and it is safe to assume that Frederick the Great and Genghis Khan likewise wanted to know the enemy's disposition before they attacked. At the completion of the last war Pershing's Situation Map was said to have been so accurate in showing the German order of battle that it might well have been their operations map. No, order of battle is not new.

Experienced intelligence officers have a deep appreciation for order of battle and it is a "must" in their sections. We younger members in intelligence work have heard of it; we know it exists, but all too often it is just three words that are meaningless. We spend so much time learning about enemy capabilities, essential elements of information, indications, evaluation, interpretation, and dissemination that all too often order of battle is something that fits into the picture somewhere, just where we aren't too sure. And how are we to know? Where is it taught? Well, it is taught to a small group of intelligence officers that take a course in order of battle so they can be specialists in that field. The rest of the army, however, still hesitates, when we talk of order of battle, as if it were some mystic formula for intelligence that no one should talk about.

Every army in the world uses order of battle. Some use it well, others not so well. It is our mission to exploit every possible means of combat intelligence. The application of order of battle opens up a field to the intelligence officer, to the G-2, that sometimes lies unexploited and all too often unconsidered.

Order of battle is the organization, the location, and the strength of the enemy forces.

In every exercise we have ever had that involved combat intelligence we have had those factors. We usually say, "We are opposed by the 'Umpty-Umpth Division' located as indicated on Situation Map A. The 'Umpty-Umpth Division' is organized similarly to ours," and so we refer to Par. *so-and-so* of FM *so-and-so* for the organization of the "Umpty-Umpth Division." Of course, we must start from somewhere and, from a purely academic viewpoint, that's as good a way as any to teach the elementary rudiments of combat intelligence. Yet too often we continue to play the "Umpty-Umpth Division" and forget that someday we will run into a force that won't be like the "Umpty-Umpth Division"— it won't be like anything in the FM's—it won't be like anything in anybody's book. Then what? Well, then we are going to learn that Par. 1*a* isn't furnished on a silver platter. We must scratch for it and maybe die for it, but we must get it. In Tunisia our forces fought divisions no two of which were organized exactly alike. Imagine what would happen if G-2 said, "We are opposed by the Hermann Göring Division. It has two regiments in the line and one in reserve." That's the way some G-2's go about stating the enemy's disposition. Of course it's incorrect; it doesn't say anything. We must know all we possibly can about the organization of the force we are fighting, the number of infantry regiments, the number of battalions per regiment, the number of artillery battalions, the size of its reconnaissance unit, the engineer unit, and possible attachments. We must know how they are armed. Do they have 37-mm antitank guns or are they 50-mm's? What is the caliber of their artillery? Is it 105, 150, or 76.2, or is it some of our own artillery taken in former actions? What about their reconnaissance unit? Is it a battalion or a troop, is it horse-mounted or is it bicycle, motorcycle, or what? How about their engineers? Are they semi-motorized, motorized, or do they walk?

Of course we know the normal organizations of a German division but the trouble with that is there are no normal divisions, at least we haven't encountered any so far in this war, and it's safe to say we won't. Take that Hermann Göring Division or the 999th or the 334th, all classic examples of the trend in organization, not only in the German Army but in all armies. They were little task forces as were all the other divisions in Tunisia and in Sicily. No two were organized exactly alike, and only slight organizational characteristics were common to all.

From the moment G-2 puts an enemy disposition on his Situation Map until the battle is over, G-2 may never really know every unit of the enemy forces on his front. He will be constantly striving to identify them and tie them down and learn from documents, prisoners of war, and other sources what ones exist that he hasn't identified. It will be a constant struggle. From his order of battle book he may learn what division is opposing him as soon as he makes his first identification and he will have a clue to its probable organization. He will know whether it's a *Panzer*, a motorized, an infantry, or a *Schutzstaffel* division. This will be a help to him in estimating their combat efficiency, and it will give him the name or number of the last known component parts of that division, but it isn't conclusive proof that that is all he is fighting.

Just a word about the order of battle book in case you aren't familiar with it. We have one on each of our enemies' armies, and it contains, in addition to much informational material on the organization, mobilization, characteristics, and type of units, a glossary of every identified unit in that particular army. Take the German OB book as an example. It lists every identified division in the German Army. It gives the number, the date of activation (approximate), the locality in which it was activated, the commander's name, the numbers of the component parts and a brief history of the division. In another paragraph it lists all reconnaissance units so far identified in the German Army, giving their number and indicating the division to which they belong or the fact that they are GHQ troops. It treats infantry regiments, artillery regiments, and all the rest the same way.

Think of what this means. G-2 receives an identification of the 241st Reconnaissance Company and simply by referring to his little book he learns it is a part of the 166th Infantry Division. This gives G-2 a clue as to what else may be on his front, and he can warn his commander what to expect; and, equally important, he can warn his units that will fight that unit, what to except, when, and where.

Order of battle to the Battalion S-2, the Regimental S-2, and the Division G-2 means those forces on his front, on his flanks, and in reserve that can be employed against him. In each of these echelons the intelligence officer will work out his order of battle. The Battalion S-2 will want to know the companies opposing him, their zones of responsibility, the location of their heavy weapons, and their strong points. The Regimental S-2 wants to know the battalions facing him, the location of close-support artillery and infantry howitzers and the location of normal support, artillery, reserves, and command posts. Division G-2 broadens his scope to regiments, reserves, lines of communication, and supply installations. All known enemy locations should be posted on a situation map. These locations are ascertained through normal intelligence agencies, units in contact passing back identification, prisoners of war, documents, intercepted messages, and the like. The value of such information is vitally affected by the element of time. Time is extremely important in order of battle because in this war of rapid movements if time is not considered the unit may be gone when the information reaches G-2, and then too you have no basis for computing time and space. Thus, time of identification in a certain location is as important as the location itself, and the time between the identification and the receipt of the information by G-2 is also vital. Order of battle information must be expedited to the rear by the most rapid means and it must not stop at division. The G-2's in corps and army are interested too, and so is our War Department. No matter how infinitesimal the importance of the information or document may seem, *get it back now!*

By keeping these identifications on his situation map, G-2 has a picture of known information on his front. By the use of liaison officers he can learn of enemy units on his flanks from adjacent friendly units, and thus he builds up his order of battle. But wait! What about those units he doesn't know about? Here I recommend the use of an Order of Battle Work Sheet. This will supplement the situation map, not replace it. It provides a method of handling order of battle. You need something on which, at a glance, you can see the entire situation, both known and unknown. The situation map and the work sheet supplement each other.* So much for location and time.

Now strength. Strength and organization go hand in hand, but "strength" means present fighting strength of your enemy at this time. This is possibly the most difficult of all the three elements to ascertain. Extensive use of prisoners, documents, and interpreted messages may give you the clues you are looking for. Strength does not only apply to men but also to matériel. The number of artillery pieces, the number of tanks, the number of vehicles, machine guns, or antitank guns—that's strength.

While organization, location, and strength are the vital elements of order of battle, they are by no means the complete picture. There are several other very important items that attract our attention. The combat efficiency of the enemy is one. Tie in with strength prior combat service, the percentage of non-German men in a German organization, losses, replacements, successes, defeats, age, etc., and you can deduce an estimate of the ability of the force you are fighting. The nationality of your enemy has some bearing on his combat efficiency. Remember last year when the Russians broke through at Serafimovich? They could have chosen another spot at which to cross the Don, for there were others more suitable for crossing operations, but they attacked Serafimovich. Why? Because they knew the efficiency of the Rumanian Third Army, and knew it was less than that of the Germans down the river. Yes, combat efficiency must be considered.

The commander is another "item" we can't forget. Who is he, where has he been, what has he done, has he any idiosyncrasies? These are matters of extreme importance. Wouldn't you want to know if the commander of the force you were fighting was a graduate of the War Academy or some Nazi politician who had risen to command?—if he was a Prussian or some Slavic general who has cast his lot with the Germans?—if he had had previous combat service in Russia or if he had had a command in some conquered country? If he had command, did he show a flair for the offensive or the defensive?

*To be discussed in a subsequent article.

Wouldn't you be interested to know if you were fighting Rommel or von Bock? All these facts can be obtained and are available to G-2's in the field. They are as much a part of order of battle as strength.

All this is Tactical Order of Battle. When we go to a still higher echelon, theater and the War Department, we still encounter order of battle but on a different plane. Here it assumes strategic proportions, and we call it Strategic Order of Battle. Every enemy unit in the theater is plotted, checked, and rechecked—its organization is ascertained and every possible bit of information about that unit is catalogued. You in the field are the major source of such information. You must pass back what you find on your many fronts so that the higher echelons can continue to do the fine job they are doing. Such valuable American publications as the *German Order of Battle* and the *Japanese Order of Battle* are made possible by this information. Long-range capabilities are determined by Strategic Order of Battle. Accurate information about the enemy forces is furnished theater commanders before moving into their theater, and they know what to expect in planning operations. The accuracy of such information was proved in Sicily, where every enemy division and its location was known before the Allied Forces landed; and the farther the campaign progressed, the more value was placed on this information because it was proved correct. We weren't surprised by the enemy in Sicily because of order of battle. Of course, some of the sources of its information are secret; but its value can not be overestimated in a campaign. It is vital in planning. While the small losses in Sicily may be due only in part to this intelligence, surely it had a great influence.

Take the final stages of Tunisia—3 May. A study of the situation map showed a mass of German and Italian forces spread along the south flank with a dwindling of forces as we moved to the west and to the north. It must follow that somewhere the Axis had some reserves waiting to fill in a gap here or a hole there, or to counterattack. But wait—compare the units identified on the line with the order of battle of the forces present in the theater (the order of battle work sheet) and none was missing. They were all on the line, none in reserve. This could only be ascertained by knowing the order of battle. What could it mean? It meant the Axis believed their old enemy, the 8th Army, was going to launch the main attack on Tunis and they covered their south flank with everything they had available. Of course, you know the result. General Alexander moved the II Corps north, pulled some of the 8th Army away from the south and moved them north too, then hit the weak flank. Resistance was heavy on the line, but once the ring was broken it was smooth sailing. Had reserves been present south of Tunis, the end might have been delayed several days or weeks. That's not the point, however. The point is that by studying the dispositions and the order of battle, it was perfectly clear that there were no reserves. General Alexander knew that once the ring was broken it would be over, and he planned on that information.

Order of battle is an integral part of combat intelligence. The War Department has seen fit to train men for order of battle teams to be attached to every division in the field. They are to do the order of battle pick-and-shovel work for G-2. However, G-2 must not lose sight of the fact that he is responsible for the production of combat intelligence; and he must understand order of battle, its significance and value. He may be a bit hazy as to what it means now, but he must learn before it is too late. Remember, there are no "divisions organized similar to ours." Order of battle will pin the division down by number or name, tell you where it's located, how it's organized, and what it can do.

You should always be an example. Always demand much more from yourself than from your soldiers. Keep up a stern discipline, but remember that orders and severity alone do not mean everything where one dies a hundred deaths. Masterful calm, advice with a touch of humor, an appeal to honor and comradeship help in many cases; in others it is done through lightening their heaviest burdens by inventing new expedients. Do not use big words. We understand and help each other as man to man, as comrades and friends. That's the only way you will lead your company here, my friend.

—A German battalion commander's advice to a new lieutenant reporting for front-line duty.

Application of Supply Principles to a River Crossing Operation

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"WHY DOES a chicken cross a road?"
"To get to the other side."

The reason may appeal to the logical capabilities of the bird; the dialog may have seemed humorous when we first heard it at the age of three or four. But as to the purpose of a river crossing, the above reason is completely inadequate, containing neither logic nor humor. If any trace of the chicken mentality enters into the plans for a crossing operation, the results can be only tragic; for a river crossing is never an end, it is always a means. It is one of the most difficult and costly of military operations, and is not to be undertaken lightly nor for insufficient reasons.

We cross a river, then, only if we must, in order to conduct further operations on terrain that is better suited for decisive action against the enemy. With this in mind, we see that our crossing operation is not complete until we have organized our command on the far side and have prepared ourselves for the next operation.

To be prepared for the next operation, our supplies must be adequate and our supply system must be in working order. The same conditions must apply, of course, to the crossing itself, and that brings us immediately to a Principle of Supply—*Supplies must continuously be adequate.*

PRINCIPLES OF SUPPLY

At this point it seems appropriate to list a few of the Principles of Supply:

1. Continuity.—Supplies must be continuously adequate. See above.

2. Forward Movement.—The impetus of supply is from rear to front. Each element in the supply chain pushes supplies forward within reach of the elements in front. This applies all the way from the original producer to the final consumer. The principle carries a reciprocal corollary—each commander must make his requirements known to the echelon behind him, and must make arrangements to draw and distribute the supplies allotted to him.

3. Advance Planning.—In any operation, tactical or administrative, there is certain to be a time lag, large or small, between plans and orders, and between orders and execution. Consequently, if supplies are to arrive as soon as required, plans must be made in advance. Requirements must be determined by estimate or calculation, and timely notice must be given to echelons in the rear in order that supplies may arrive as needed.

4. Freedom of Action of Combat Troops.—Supplies in the hands of the using troops must be held down to a level compatible with the immediate needs and the mobility of those troops.

5. Mobility.—Supplies must be mobile, actually more mobile than the using troops. Starting from locations in the rear, supplies must be able to overtake the troops in time to be available as needed. To this end our transportation must be kept in prime operating condition. When transportation is available, rolling reserves are maintained. Supply vehicles that have been diverted to troop movement, or to any other use, revert to their basic function without delay, and normal cargoes that have been dumped are promptly reloaded. Sufficient labor must be available at all transfer points.

6. Intact Unit Reserves.—Unit reserves of supplies, when drawn upon, must be replenished as soon as possible.

7. Reserve Supplies in Echelon.—Reserve supplies should be echeloned in width and depth in order to be made available when and where needed, despite the effect of enemy success against a portion of our supply system.

8. Security.—Supplies must be adequately safeguarded against loss from any cause, including enemy action.

The above principles apply to supplies proper. We can also consider the supply system and a few of the applicable principles, such as:

9. Simplicity.—A simple system is less conducive to mistakes and is more likely to succeed than a system that is complicated.

10. Flexibility.—The system should conform readily to the requirements of the tactical situation. Flexibility is dependent upon decentralization of operations, efficient administrative control, and intelligent employment of the available supply facilities.

11. Elasticity.—The system, or any of its elements, should be able at any time to expand or contract to meet new conditions. Plans should provide for expansion or contraction of stock levels, facilities for handling supplies, and manipulation of the supplies, to conform to variations of tactical plans.

THE PROBLEM

Now let's write a river-crossing problem and see how the principles apply:

The enemy has retired to the north across an unfordable river (see Figure 1), destroying all bridges behind him. We have air superiority. The Corps has mopped up on the south side; and the Corps Com-

mander has directed that several divisions shall force a crossing at dawn a few days hence.

More specifically, our Division, with adequate attachments of engineers, antiaircraft, field artillery, tank destroyers, tanks, and cavalry, is to cross on a frontage of several miles, building a heavy ponton bridge and seizing dominant terrain beyond the river preparatory to the resumption of further offensive operations.

Application of Principles

NOTE: In the discussion that follows, the Principles of Supply will be referred to by the arbitrary numbers given above.

Principle 3.—It takes no oracle to tell us that advance planning is in order, so we start in at once on the preparation of our G-4 estimate, the necessary preliminary to our G-4 plan. Immediately we find we need additional information, as the Administrative Estimate is based primarily on the tactical plan and its probable developments. Three developments in particular concern us: the period of time required for the operation, the location of major elements of the command throughout that period, and the nature of combat expected. If we don't know these already, we look up G-3 to find out what's cooking. Let's assume he tells us the Division will cross with two combat teams abreast, each on a broad front near the respective outer boundary of the Division zone. The Division's main effort will be on its right. The bridge will be built near the center of the zone, work to start as soon as the bridge site is safe from observed artillery fire. North of the river, he plans for two days attack of a position, and one day of pursuit.

Now we can determine our requirements for ammunition. Experience tells us they will be as follows, in units of fire.*

	Arty	*Inf*
Attack of Position, First Day	2.0	1.5
Attack of Position, Second Day	1.0	1.0
Pursuit, One Day	1.0	0.5
Total	4.0	3.0

See Principles 6 and 2 (corollary) above.—We check the supply status of our units and attachments to make sure their unit reserves are intact, and we ensure that credits are established for the ammunition we expect to expend.

As we talk further with G-3, the division engineer, and the commanders and staffs of lower units, we acquire further details of the operation-to-be that affect our supply planning.

We learn that the initial crossing will be in assault boats, that construction of raft ferries will start promptly, that probably three to four hours will be required to reach the intermediate objective (B-B on map, Figure 1), and that six additional hours will be required to build the bridge.

Does that mean that nine or ten hours after the jump-off we can begin running supplies over the bridge? It does *not*. If there is any fight at all remaining in the enemy, he will be counterattacking by that time with all the means at his disposal. Tank destroyers and tanks, followed by field artillery, will cross the bridge. We will be fortunate if we get a single supply vehicle over that bridge within twelve hours after the attack starts. When the bridge does become available for supplies, ammunition and mines will have priority. (Principle 6 again.)

All right for Principle 6. How about Principle 1? How can we fight for twelve hours and still be able to say our supplies have continuously been adequate? The answer calls for Principles 2, 4, 5, 7, 9, 10, and 11.

At the latest possible moment before the attack, each man will receive a hot meal. He will carry two-thirds of a K ration and one D ration. Thus, his food is provided for 24 hours, possibly 48; and we expect that the kitchens will be able to rejoin their units north of the river sometime during the night following the first day of attack. Thus we have applied to Class I Supply, Principles 2, 4, 5, and 9.

To Class III Supply (gasoline and oil) we apply Principles 5, 6, and 9 without conscious effort. Small supply stocks are set up at each final halting point south of the river. At its final halt each vehicle is filled "to the gills" with gas and oil. It will arrive north of the river with fuel for many hours of operation. A more formal advance of Class III supplies can thus be given a priority below that for ammunition.

The hardest problem we have to solve is ammunition supply and resupply. At least, it requires the most man-hours of labor. We have seen that units will cross the river initially, each on its own broad front; each unit will have to get its own ammunition over the river by its own means in its own area.

Each soldier armed with a rifle will be issued extra ammunition (2 bandoleers) prior to embarkation in assault boats; so he will enter the fight with about 1 U/F (unit of fire).

If automatic rifles are accompanied by basic loads, each will have available 2/3 U/F (500 rounds; U/F = 750).

Machine guns and 60-mm mortars can be taken across the river in assault boats, together with a limited amount of ammunition; but both weapons and ammunition will have to be man-handled until it becomes possible to ferry the weapon carriers.

It is essential that assault boats, particularly in the initial waves, unload with all possible speed and therefore no more ammunition should be placed in the assault boats than can be actually carried by the squad serving the weapon.

The 37-mm guns, the 81-mm mortars, and the in-

*A unit of fire (hereafter referred to as U/F) for a designated organization or weapon is the quantity in rounds or tons of ammunition, bombs, grenades, and pyrotechnics which it may be expected to expend on the average in one day of combat. The unit of fire can be used by any echelon for planning purposes. In actual allocations, expenditures, or reports, quantities of ammunition are expressed in rounds by all echelons below army.

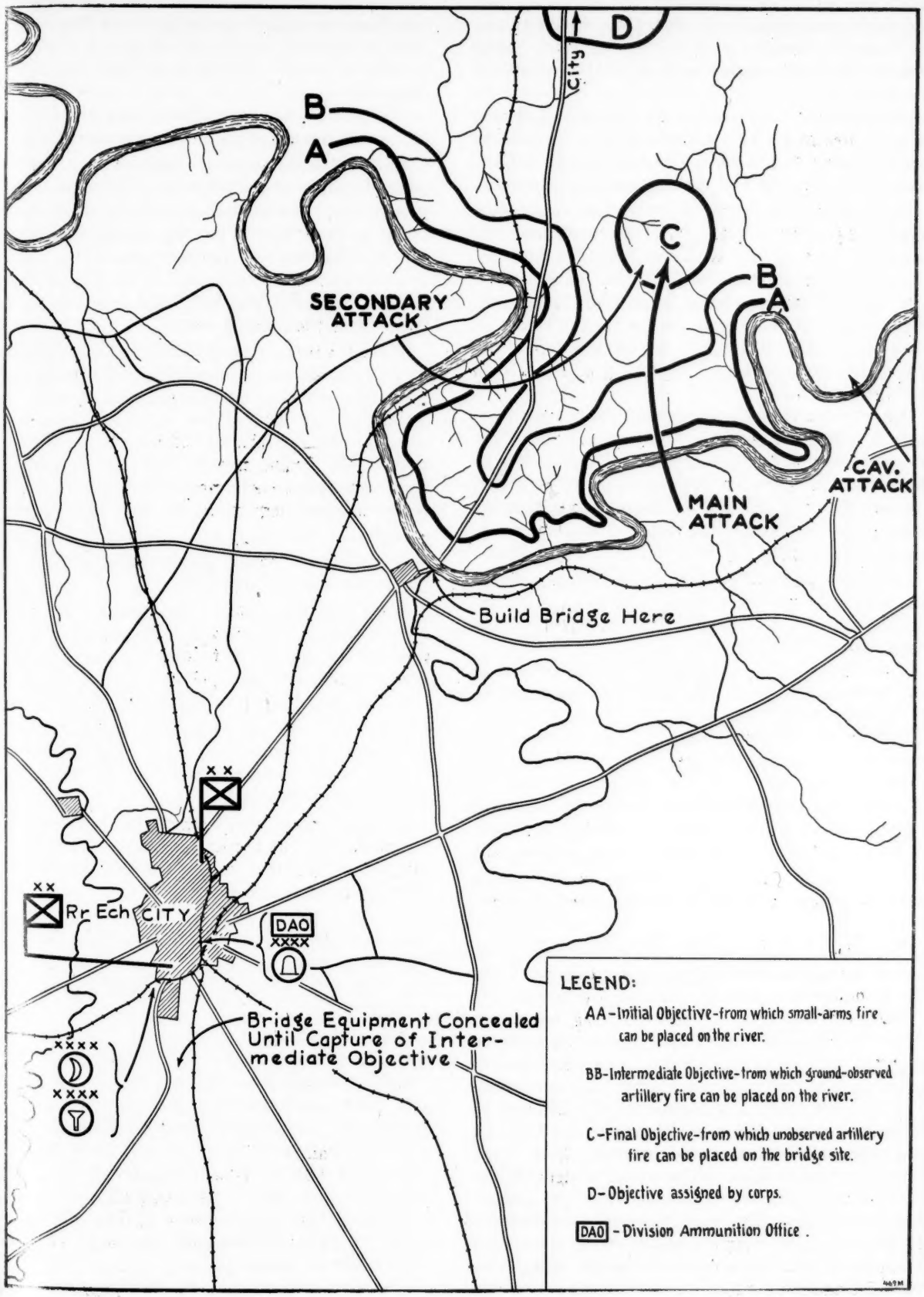
D
City
B
A
C
B
A
SECONDARY ATTACK
CAV. ATTACK
MAIN ATTACK
Build Bridge Here
XX
Rr Ech
CITY
DAO
XXXX
Bridge Equipment Concealed Until Capture of Intermediate Objective
XXXX
XXXX
LEGEND:
AA - Initial Objective - from which small-arms fire can be placed on the river.
BB - Intermediate Objective - from which ground-observed artillery fire can be placed on the river.
C - Final Objective - from which unobserved artillery fire can be placed on the bridge site.
D - Objective assigned by corps.
DAO - Division Ammunition Office.

FIGURE 1.

fantry howitzers should support the attack initially from the south side of the river; but should be ferried across, together with weapon carriers, prime movers, and ammunition, as soon as the ferries are in operation.

So much for supply—now for resupply. Riflemen will require at least an additional ½ U/F prior to dark, automatic riflemen will require about 1 U/F, and other weapons will require considerably more.

As soon as troops across the river have established a small bridgehead, vehicles of the regimental ammunition train should stack their loads of infantry ammunition along the river at sites convenient to the landing stages (ferry terminals) being constructed for the ferries. As soon as the ferries are in operation, ammunition will be ferried across the river and infantry supply points will be established on the north side.

Quarter-ton trucks, weapon carriers, 81-mm mortars, 37-mm guns, and infantry howitzers with their prime movers will be among the first loads after the ferries are in operation. Ammunition will be placed on each ferry in addition to this equipment. After the jeeps and weapon carriers have crossed the river, ammunition supply will be accomplished as follows:

The Unit Ammunition Train will operate between the ASP (Ammunition Supply Point, an *army* installation) and the stacks of ammunition on the south side of the river.

Ammunition from these stacks will be ferried to the north side of the river and placed in supply points close to the landing stages.

Ammunition from the supply points north of the river will be hauled in jeeps, weapon carriers, and prime movers.

Additional ammunition will cross in such assault boats as are no longer needed by north-bound troops.

No ammunition vehicle will be ferried across the river unless, and until, it is more urgently needed than the weapon or prime mover it replaces as ferryload.

This process will continue until sufficient ammunition is accumulated north of the river to take care of the ammunition supply for the first and possibly for the second day of attack. At least 2½ U/F in addition to basic loads should be moved across the river by daylight of the second day of the attack. The labor requirements are high. For an infantry regiment with a U/F weighing 80 tons, the plan calls for 200 tons to be moved in about 20 hours. Forward of the ASP, the regiment manhandles each container three times more than usual. Without the river, we visualize the ammunition as traveling directly from the ASP to the Battalion Supply Point, where it is distributed to individuals or weapons carriers (see Figure 2). With the river between the ASP and the fighting, we visualize the ammunition as man-handled from the truck to the stack, from the stack to the ferry, from the ferry to the supply point, and from the supply point to individuals or weapons carriers—four man-handlings, as against one without the river. At one-half ton of handling per man-hour, this requires up to 1200 additional man-hours of labor per infantry regiment.

The plan for artillery ammunition would be similar to that described for infantry ammunition.

Initially, the artillery will support the attack from positions south of the river. As soon as batteries go into position, the Battalion Ammunition Train will dump its basic load at the battery positions to take care of estimated requirements prior to the forward displacement of the batteries. After this the Battalion Ammunition Train will haul from the ASP to stacks near the landing stages.

When the infantry gains a bridgehead sufficiently deep to prevent machine-gun fire on locations chosen for battery positions north of the river, it will be time to ferry the artillery. Prime movers, howitzers, and certain command vehicles will have first priority for the voyage. Prime movers will carry their basic loads, and additional ammunition will perhaps be placed on each ferry up to the limit of its capacity.

North of the river, this additional ammunition will be placed in supply points similar to the supply points for infantry ammunition.

When battery ammunition trucks are ferried across, they will carry full loads, dump at battery position, and haul from the landing stages as ferries are unloaded or from supply points.

The Service Battery will continue to operate south of the river until enough ammunition has been ferried across to meet the requirements for the first day or two. It will then cross the river, loaded, possibly via the ponton bridge.

Ammunition supply north of the river will be accomplished by the battery ammunition trucks, supplemented by other transportation, meaning the prime movers, if necessary.

At least two, preferably three, U/F should be placed across the river in addition to basic loads. Battery 5th Sections should also be used on the haul from the ASP prior to the time they are ferried across the river.

All this handling and rehandling of ammunition is wasteful of labor. It should terminate at the earliest possible moment. That moment comes when the ferries have transported the last load with priority higher than ammunition vehicles. From that time forward, ammunition vehicles will make "through" trips from ASP to using troops. However, it will be several hours after the jump-off before these "through" trips can commence, as there will be many weapons, prime movers, and command vehicles for the ferries to carry.

The above examples apply the Principles of Forward Movement (2), Freedom of Action of Combat Troops (4), Mobility (5), Reserve Supplies in Eche-

lon (7), Simplicity (9), Flexibility (10), and Elasticity (11).

No claim is made for ease or economy. The plan is expensive and calls for hard labor, but it is simple, flexible, and elastic.

Mobility (5), Echelonment (6), Flexibility (10), and Elasticity (11) are further applied in the case of maneuver. The original tactical plan calls for our main effort on the right. Suppose after a few hours it develops that better progress toward the objective is being made on the left. Sound tactics demand that do not encroach upon the maneuver space of our own combat troops, then the closer in we move our supplies and installations, the simpler we make our task.

When our troops cross the river, they separate themselves from the bulk of their supplies except for the ammunition arriving via the crossing points, which can be considered as a number of parallel defiles. The defiles will present remunerative targets to the enemy, and he will focus his attention upon them—for it is plain that if our troops cease to

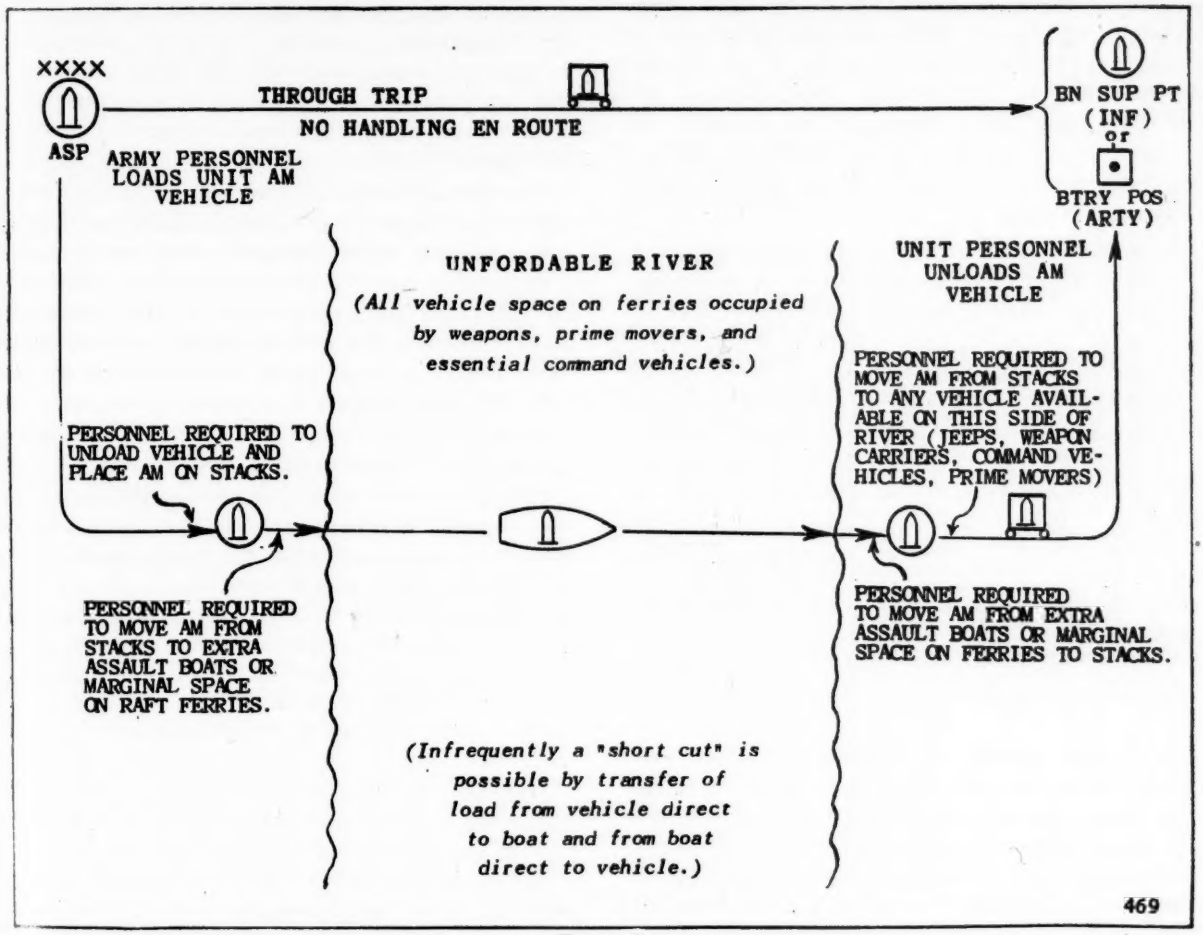
XXXX
ASP
ARMY PERSONNEL LOADS UNIT AM VEHICLE
THROUGH TRIP
NO HANDLING EN ROUTE
BN SUP PT (INF)
or
BTRY POS (ARTY)
UNFORDABLE RIVER
(All vehicle space on ferries occupied by weapons, prime movers, and essential command vehicles.)
UNIT PERSONNEL UNLOADS AM VEHICLE
PERSONNEL REQUIRED TO MOVE AM FROM STACKS TO ANY VEHICLE AVAILABLE ON THIS SIDE OF RIVER (JEEPS, WEAPON CARRIERS, COMMAND VEHICLES, PRIME MOVERS)
PERSONNEL REQUIRED TO UNLOAD VEHICLE AND PLACE AM ON STACKS.
PERSONNEL REQUIRED TO MOVE AM FROM STACKS TO EXTRA ASSAULT BOATS OR MARGINAL SPACE ON RAFT FERRIES.
PERSONNEL REQUIRED TO MOVE AM FROM EXTRA ASSAULT BOATS OR MARGINAL SPACE ON FERRIES TO STACKS.
(Infrequently a "short cut" is possible by transfer of load from vehicle direct to boat and from boat direct to vehicle.)
469

FIGURE 2.

success be reinforced; and the Division will be prepared to switch its reserves and fire support to the left, changing the direction of the main effort. Sound administration demands that the supply plan be modified in compliance with the tactical plan. Attention and effort will be concentrated on pushing supplies forward in the zone of the new main effort.

No mention has been made so far of Principle 8, Security. At present the river is a barrier between us and the enemy. This barrier works for us as well as against us; it minimizes the enemy capability of mechanized action against our supplies. Provided we stay out of effective artillery fire (and this is a matter of concealment and cover as well as of range), and provided we protect ourselves one way or another from air observation or attack, and provided we have adequate supplies they will become vulnerable to counterattack. The longer they are without adequate supplies, the more vulnerable they will become. The obvious way to minimize this threat to the operation is to minimize the length of time that the condition of separation exists. We must work in against the river as close as we can; and as soon as the combat troops are across (men, guns, and tanks), across the supplies must go—regardless of security. Of course we must keep our supplies locally dispersed south of the river, on the river, and north of the river; it would be senseless to make it easy for the enemy to destroy them. But our one main job is to get them across the river promptly, in sufficient volume, and without confusion. It is far better to lose a few supplies than to risk the loss of our troops.

Keeping Up-to-Date

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IN OUR opening talks to all classes we impress upon them the fact that the instruction they are to receive is up-to-date and modern in every sense. The question may arise in some minds as to whether we can justify those statements or whether they are just words. We say them in good faith and really believe that they are strictly true. We have made a distinct point of completely modernizing all our instruction since the moment war threatened, and we have continually added emphasis and pressure on that phase of our teaching to the extent that we believe that we have been and still are as up-to-the-minute as it is possible for a school to be.

Our methods of keeping up-to-date have involved the establishment of routine channels for receiving the latest information; the establishment of special channels for the same purpose; contacts with special observers and critics; utilization of visitors from interesting theaters, overseas or otherwise; special reports from alumni, ex-instructors, theater commanders, and travelers; the employment of special instructors who have had recent experience; and the utilization of our own officers who are now returning from active theaters. All of the above has been done to effect a system whereby we are on the receiving end of first-hand, interesting, and sound information. In addition to all that, we have sent many of our key instructors to the various theaters to get for us what we have failed otherwise to obtain.

The routine sources of information which are available to us are, first of all, the reports from all our military attaches and observers abroad who report to the Military Intelligence Division in Washington. Copies of all their reports which would be of interest are forwarded to us at once. MID keeps us as well informed as they are themselves on all of the subjects in which the school could have interest. Through them we get the same service from the Office of Naval Intelligence and any other intelligence agencies. We also have the benefit of their periodic studies and estimates.

We are on the list for the studies prepared by Army Ground Forces on tactical developments and trends, which keeps us up-to-date not only on what is happening in those lines but also on the ideas and opinions of our high command on those subjects.

We are subscribers to numerous foreign military publications from which we get many interesting articles. They are a fruitful source for combat incidents which can be used as illustrations. We have our own translators of German, Russian, French, Polish, Italian, Spanish, and Portuguese publications. So you can see that we cover the world's military writings pretty thoroughly.

The Operations Division of the War Department favors us with copies of strategical studies, observations made by observers from their office, and studies of observations made by theater commanders. These have been of immense value as they bring us right into close touch with the officers who have had experience in tactical and logistical problems exactly paralleling those about which we teach at the school.

The British assist us with reports of all kinds which they receive from London and from various British theater commanders. These are quite similar to the reports received by our Operations Division in that they generally consist of the observations of theater commanders or commanders of large units citing their views on recent operations and the lessons they have learned.

To insure that we are not overlooked in getting any of these red-hot reports, and that we get them promptly, we now have one of our instructors in Washington for the purpose of determining the things we want and getting them to us. He is known as a liaison officer and is attached to the G-3 Section of the War Department. His field of action is the whole War Department, or rather all Washington. We have been assured that he will be permitted to roam at large and sit in on any meetings of importance which would deal with anything of interest to us.

The above arrangements establish a routine flow of current information which, when it is received here, is analyzed and circulated to the interested instructors who use it to enhance the value of their platform presentations or check it to prove the soundness of our teachings. We have also found that we gain a vast amount of a fine type of information from the questioning of visitors who have been in interesting theaters. Among the first of these I would like to mention the group of special observers that we have brought before each class to lecture on subjects in which they are highly qualified experts. An officer who was for many years in Japan as military attaché and as a language student, was on a mission in Thailand, Malaya, and Burma just before Pearl Harbor, was caught in the Philippines on that date, and served with MacArthur until the fall of Corregidor, has been our expert on the Japanese Army, its organization, training, and psychological attitude. We bring him back for each class and always gain a great deal of new information from him, as he keeps himself constantly informed

regarding the Japanese and has the very best sources of information available to him. We have a similar expert on German affairs, an officer who has the German desk in the Military Intelligence Division and also was in the military attaché office in Berlin for several years just prior to 7 December 1941. He keeps us up-to-the-minute on German matters and anything of interest from MID. We have been fortunate in having Mr. Hanson W. Baldwin appear before several of the classes and give us his observations and opinions on world affairs with which he keeps such close account. We have also been favored for the last four or five classes by having Father Edmund A. Walsh, Regent of Georgetown University, appear and give us his opinions on geopolitics and world affairs, on both of which subjects he is a well-known expert. All of these experts have made themselves available to us and have submitted themselves to many hours of gruelling questions before the instructor body, which has been of inestimable value to us.

We have been able to have as guest speakers on administrative subjects a long list of officers from important home offices, such as the commanders of practically all of the ports of embarkation, the chief of staff or an assistant from every Service Command, the chief or a representative from all of the new or unusual bureaus of the War Department. They have all brought us up-to-the-minute in their field.

Another special source has been the visits of returning officers who have held prominent posts in various theaters. Not a week passes but that we have one or two of them. I can mention some such as Colonel Chester F. Sharp, an expert on ports of debarkation; Brigadier General L. S. Kuter, deputy commander of the Mediterranean Air Force; Brigadier General Charles A. Willoughby, G-2 to General MacArthur in the Southwest Pacific; General C. L. Scott of the Armored Command; Colonel E. B. Gallant from the G-4 Section of General Patton's headquarters in Sicily. All are exhaustively questioned by the faculty; some are put on the platform before the whole student body.

We also have been benefited by conferences with and opportunities to question many foreign visitors who have brought us news from their theaters. Among these I might mention some recent ones of particular interest such as Air Commodore A. C. H. Sharp, Deputy Chief of Staff from our 8th Army Air Force in England, and Wing Commander J. R. Robinson, A-2 of the same headquarters, with latest news regarding the program of bombing Germany. We gather recently had Brigadier W. G. Gentry from the New Zealand division that was with General Montgomery in Africa. They gave us the accounts of their action against the southern front of the German positions in Tunisia. They were followed shortly by Brigadier E. C. Pepper and Brigadier F. A. Vincent Copland-Griffiths who were with the British First Army in Tunisia and who gave us their observations on the fighting in Tunisia from that sector. Lieutenant Colonel Puller, Marine Corps, from Guadalcanal was most interesting and timely.

We are constantly receiving letters and reports from our alumni and ex-instructors who are now in active theaters. We have, of course, encouraged them in this and the results have been most gratifying as they always give us reports that are directed straight at the soundness or errors of our teaching. We have been happy with most of these as they have as a general rule confirmed the soundness of what has been put out by the school. We have taken occasion at times to circularize theater or other high commanders in active places for their remarks and suggestions on various phases.

Another feature which has enabled us to keep up-to-date and has permitted us to work in a new field has been the loaning to us by the British Mission of officers of high ability and recent combat experience. We have obtained also a high ranking officer of our own Navy. We have placed these officers in the faculty group and have used them extensively in an advisory capacity, and use them at times on the platform. Their assistance has been invaluable, particularly since we are now going into the field of joint and combined operations. This field covers not only the amphibious operations with joint Army and Navy staffs but also the combined operations involving the work of the British staffs and troops. The first British officer to be used in that way was Colonel John G. Cowley who was Q (G-4) of the armored division and later with the army corps operating under General Montgomery in all of the fighting in North Africa, including the battles of El Alamein and the pursuit of Rommel as far as Tripoli. He came to us directly from there after his corps was replaced. We now have a new officer, Colonel Michael Lubbock, who replaced Colonel Cowley in the corps headquarters and who continued in that capacity until the defeat of Rommel in Tunisia. At the same time we received an air officer of considerable experience in the Mediterranean theater, Wing Commander Michael T. Judd, who first took our course and is now assisting the Air Corps instructors both as an adviser and as a platform speaker. Our naval representative is Captain J. B. Earle who was with our Navy at Pearl Harbor in its most eventful days and who advises us and lectures on naval matters in all joint operations.

We are now commencing to get as instructors officers who are returning from overseas theaters. We have just received one who was wounded while with the 1st Division in Tunisia and are about to receive another officer, who was also wounded in Africa, to head a faculty Section. We are constantly scanning the lists of returning officers with the hope of getting the good ones to add to our instructor list and thus keeping ourselves up-to-date and modern.

Many of the students that are now passing through the classes have had overseas experience. This is particularly true of the air corps students. We have them contribute to the class and thus benefit by their presence.

In spite of being able to get information from all of the above sources, we realize that there is nothing like seeing for yourself and so we have taken advantage of every opportunity to send our instructors to various theaters for first-hand observation and experience. Just prior to the landings in Africa we were permitted to send two missions to England. The first one was to cover the field of combat intelligence; the second, consisting of three officers representing the ground, air, and service sections, was to cover all phases of our teaching. We have been permitted to send two missions to Africa—in fact, they are still there. They represent our instructional sections dealing with air, ground, service, airborne, armored, and logistical matters. They have all had the enviable experience of taking part both in the landings on Sicily and on the mainland of Italy, and when they return will have valuable information for us. We had an instructor in Alaska at the time of the Attu affair and again when we landed at Kiska. A mission of three officers representing the air, ground, and service sections of our instruction has just returned from a visit to the Southwest Pacific theater. Just now our commandant is visiting active overseas theaters as an observer. On the homefront we send our instructors to all maneuvers, training centers, ports of embarkation, prisoner of war camps, and other places of unusual activity. The War Department itself is canvassed periodically for new material. Our Service Staff Course depends almost entirely for its instructional material on these visits, as there are few text books on the subjects dealt with in that course.

So you see we have covered through our observers practically the entire field of activities of our Army. It has paid big dividends.

All of this must be translated into instruction. This we require each instructor to do. Some of the new things directly affect our principles and doctrines. Where these are approved by the War Department or appropriate authority we give them out as such. Other features are used for illustration or proof of the soundness of our teachings.

To carry further this same idea, we now base all our applicatory exercises on foreign terrain of probable interest. This program keeps us ahead of events. It is useful, interesting, and instructive to have exercises in theaters that are currently active.

If you add all this up I believe it justifies the statement that we are keeping up-to-date. QED.

The Military Geologist

WHAT sort of man should the military geologist be?

In the first place, he should be a professional geologist of the widest range of sound training and field experience in areal mapping, engineering geology, geomorphology, and the geology of unconsolidated materials. Particularly desirable are the qualifications of the engineering geologist as outlined by Berkey. "He must have the principles of geology so well in hand and feel so sure of them in their application to the actual ground as it is that he is not in the least disturbed at finding everything of a geologic nature belonging to a particular project materially different from anything he has ever seen." Text books and field manuals are of small value; once in the theater of war it is too late for grounding in either theoretical geology or the theory of war. As Muller has said of the commander, "He must meet every new situation with an open mind, recognize novel and unprecedented conditions, and apply both knowledge and imagination with a deft touch."

Secondly, he must be a soldier with qualifications that fit him for the Corps of Engineers. In addition to the basic training he should have an additional background of staff training and experience, for his function will be chiefly advisory and reconnaissance; but he must be able to fight and lead troops if through the fortune of war command should descend to him. However, his knowledge of military history, strategy, tactics, and technique of modern arms should be developed not so much for the purpose of command as for an analytical tool for evaluating the military features of the terrain. He should be able to appreciate the military situation so that his work can be properly subordinated and correlated to the mission of the force to which he is attached. He should "know accurately and in detail what troops can and cannot do" so that impractical and infeasible suggestions may be avoided; and he should be able "to foresee what the troops will be able and will not be able to do in the future" (Fuller) so there will be no lapse in the continuity of his work. And he will ever bear in mind that the contributions he makes to terrain appreciation are only an aid to the attainment of the real objective, which is the enemy himself. (From "Application of Geology to the Principles of War" by Charles E. Erdmann, in *Bulletin of the Geological Society of America*, 1 August 1943.)

Supply in New Guinea

MAJOR CHARLES W. WALSON, *Cavalry*

Major Walson was a military observer for the Army Ground Forces in the Southwest Pacific area from 1 May to 20 July 1943. During this period he spent a month and a half in New Guinea. He observed the early stages of the landings on Kiriwina Island, and the various troop installations shortly after the landings by American troops at Nassau Bay.—THE EDITOR.

THE PROBLEM of supply in New Guinea is interesting due to the difficulties that must be overcome and the variety of solutions of these difficulties. Every commander who has had combat experience in New Guinea emphasizes the importance of supply and its influence on operations.

The two main difficulties in the problem of supply in New Guinea are the long distances and the unfavorable terrain. The distances over which supply lines must stretch are quite evident to anyone who studies a map of this area. However, the terrain is perhaps the worst obstacle to overcome.

The terrain of New Guinea has been described before in newspaper accounts and in reports of fighting in that area, so this article will only describe it briefly. In general, the island has very rough mountains in the interior, and a few narrow coastal plains along the shore. The mountains are so steep that any road building in them would be a major engineering job, while the coastal areas have the disadvantage to road builders of swamps, rivers, and heavy jungle growth. Road nets except for small areas around camps are practically nonexistent. The few trails are generally unsuited to vehicular transportation.

There are no modern ports available with facilities for rapidly unloading large ships. Also, scattered reefs along most of the shoreline cause additional difficulties to water-borne supply. Often ports are unsuitable for any but small ships.

An examination of the different methods which are available to supply personnel for transporting supplies in this inhospitable terrain discloses that methods from the most modern to the most ancient are employed.

The one sure mode of transportation of supplies is by use of the native carrier. This short, kinky-haired, durable man is the last resort, but often the salvation of many a difficult supply situation.

The native carrier works about six hours per day. If he is worked much longer, he wears out pretty rapidly. Each native carries about forty pounds of supplies. He carries his load in a variety of ways. Generally he makes his own pack; however, burlap sacks should be available to make "boy loads" of forty pounds each in case a breakdown of the articles to be carried is necessary.

It is necessary to apportion the loads according to the capabilities of the carriers. The stronger native can carry a case of "C" rations up the side of a very steep ridge where it is necessary for him to use his hands as much as his feet, and can climb for three hours with very short breathing spells. Another typical load for a strong native would be a cloverleaf of 75-mm howitzer ammunition.

The native carrier would rather make his own pack than use any pack designed for him by white men. The packs that the natives make are very simple. A blanket is rolled (the blankets which are furnished the natives are small and thin and, when rolled, are about two inches in diameter) and is strapped on to the load to form a harness. The natives are quite clever at placing the blanket so as to pad their bare backs from the rubbing of the load. Vines and strips of bark are used for binding material. Larger loads are suspended on poles and carried by two natives, but this is more difficult, and a single load is preferred.

The distances over which a carrier supply line can operate are limited by the amount of food it is necessary for the natives to carry for their own consumption. A native's ration for one day weighs about one and a half pounds. The limiting practical length of a carrier supply line can therefore be calculated as about six days travel time. If native rations are supplied by air, the length of the line can, of course, be extended.

The native carriers build their own camps at bases which are established along the supply route. They can rapidly build the native-style huts. It is best to have the carriers stay at the same camp every night so that new camps do not have to be constructed for each night's bivouac. The supplies should be passed from camp to camp on their way to the forward area.

The native carriers are divided into small detachments commanded by "boss boys." These "boss boys" are selected by the white man who is in charge of the carriers, and are selected without regard to tribes, because there are too many tribes represented in each group of carriers to make a tribal breakdown possible. If the "boss boys" cannot handle the men in his group, he is rapidly replaced by another native. He usually has about twenty natives to supervise. The job of "boss boys" is coveted by all natives because of its prestige, and because the "boss boy" does not have to carry any load except

his personal belongings and the stick which is his badge of office.

If one is available, it is best to have an Australian representative of the territorial administration to handle the natives. He knows "pidgin English," is used to dealing with the natives from long years of living in the country, and does not "spoil" them as our troops are prone to do.

"Spoiling" the natives is a practice that must be rigorously stopped by all commanders. The American soldier is naturally friendly, and cannot resist the opportunity to be a "big shot" and a "good will ambassador." He sometimes gives away cigarettes and overpays the natives for their work. When they begin receiving this largess for little or no work, they begin to expect more money for any work that they do, and, since they have no conception of the value of money, they begin to ask exorbitant prices for the slightest bit of labor. Once they get any sizeable amount of money they stop work and are of no value.

The natives are paid 10 shillings per month (about $1.60) plus clothing, food, and tobacco. In addition to this they receive medical care. They are sometimes quite childish about medical attention. All the natives in a group want to wear bandages if they see another native in the group with a bandage.

Another means of transportation is transportation by water. If a water route exists, this method of supply is by far the most efficient. Any type of craft that will float has been used. Japanese landing craft that have been salvaged, barges, small coastal steamers, Diesel ships, trawlers, and other types of ships and boats are all employed. The crews of these ships, barges, and boats are as assorted as the craft themselves. They are composed of a mixture of soldiers and civilians. Naturally, organized boat companies are used when available and their organization and uniformity makes them the most desirable mode of water transportation.

During the Buna campaign, the ¼-ton truck with the 1-ton trailer was a very important means of supply. In order to use this mode of transportation, a road had to be constructed and this meant corduroying for long distances. Some of the corduroy roads at Buna are three to four feet high. Larger trucks were unsuitable during this campaign. The ¼-ton truck will probably be the major means of land transportation in future campaigns in this theater.

Air transport is used in New Guinea to carry all types of supplies. It is amazing to see some of the things which are packed aboard airplanes in this theater.

Air supply may be either air-transported or air-dropped. It is necessary to have fairly good runways for air-transported supplies. Some of the fields which have been used by our fliers are very rough and would be condemned for use by much smaller aircraft in the United States. There were many times when airplanes had to land on fields that were covered with water.

Air-dropped supply is a less desirable method of air supply which has been used frequently in New Guinea. A drop strip is all that is necessary on the receiving end. Sometimes a drop strip is a stretch of kunai grass. At other times, it is a river bank or a marked area of jungle growth. Smoke pots are used to mark the strips so that fliers may see where the drop strip is. In jungle growth the smoke pots are placed on poles.

An example of this type of supply was the dropping of supplies near Nassau Bay, which is south of Salamaua. The strip which was used in the early part of the operation was merely a portion of river bank. Some of the supplies which were dropped there would hit large boulders, some would be lost in the brush, and some would land in the river. The recovery was estimated at 80%. Most of the supplies were dropped free after being packed in cylindrical metal containers with straw. Rations only were dropped at this point except for one emergency dropping of shoes. Parachutes were used rarely to drop breakables. Ammunition was not dropped due to the condition of the strip.

Although few pack trains have been used in action in this area, it is believed that there is a definite need for them. They would be best made up of mules, which would be more reliable in this type of terrain because of their steadiness. They can be trained to eat kunai grass and therefore the supply problem of feeding them would be very much simplified. Naturally, there are places where mules cannot travel, but they would be most valuable to augment the other means of supply.

Tractors are very useful for dragging trailer-loaded supplies on trails which are impassable to ¼-ton trucks. "Alligators" or amphibious tractors were found to be useful by the Marines at Guadalcanal.

The methods used to supply the troops who landed at Nassau Bay give some idea of the transportation problems which might be encountered in a similar operation in the future. Large sea-going ships carried the supplies to Oro Bay. At this point they were laboriously unloaded and loaded onto small coastal steamers or Diesel driven ships. The coastal steamers traveled up the coast for a distance of about 120 miles to a point where they were unloaded and the supplies were reloaded onto barges or small landing craft. The barges or landing craft carried the supplies to the beach at Nassau where they were unloaded, and the supplies were carried by ¼-ton trucks and trailers to the beach dumps. Natives then carried the supplies inland to the forward battalion's C.P. From there, carrying parties of sol-

diers carried the supplies to the companies. The actual distance inland was only eighteen miles, but the terrain was so difficult that it took three and a half days to get the supplies from the beach to the forward elements of the command.

This chain of supply was supplemented by air-dropping of rations at an inland position, but it was still necessary for the natives to carry the supplies for two days before they could reach the troop carrier parties.

A Hospital Rolls Through Europe

[Translated for the Command and General Staff School, Fort Leavenworth, Kansas, from an article in *Donauzeitung*, Belgrade, Jugoslavia, 1 July 1943.]

THE hospital train of thirteen cars which has just arrived, bringing the wounded to their home stations, is a completely equipped small hospital on wheels which can minister to all the needs arising during its journeys of many days.

Besides the comfortable and airy cars for the wounded, one car serves as sleeping and living quarters for the medical officers, the accountant, the "top" sergeant (for even he has to be there with a crew of twenty-three men), and also other medical personnel. A second car serves for the enlisted men. Of course, everything has been arranged so as to save as much space as possible, because the more cars in the train the more cumbersome it would be. But during the long period that the train crew has been living together improvements have been introduced, with the result that today a beautiful and cozy home atmosphere has been created. In addition, there is a small but well-equipped accounting office, since this train in its travels is a completely self-sustained unit and food supplies and other necessities required in an emergency must be purchased locally.

In this connection the last two cars of the train are worthy of mention: the kitchen car, and the supply car in which everything that may be required for the material well-being of the wounded is stored. The supply car is partitioned, and contains cabinets and compartments in which all provisions (and there is an almost unlimited variety of them) are stored in such a way that they will not spoil. The responsibility for this job rests with the accountant, who, with more than a year's experience in this work, is able to meet all eventualities as they arise.

On the hospital train individual patients frequently require special diets; hence trained dietitians are needed for the preparation of hot or cold meals requiring the skill of the expert.

At regular intervals the hospital trains sends a courier to the control station in Germany where the Field Post Office of the train is located and where those orders are awaiting that have not already been passed on by telephone through one of the way stations. From this center, likewise, the most difficult problem—that of furloughs—is solved.

What distinguishes these hospital trains—and many of them are now running—and gives them their unique character is the equipment of the operating room, which contains everything that is needed in a modern field hospital. Of course, the work of the surgeon is much more difficult here than in a stationary operating room, but results have proved that he works in this swaying room with the same skill as in his professional surroundings at home.

Travel for weeks at a time puts the moral and physical forces of everybody under heavy strain. The rest periods are all too short. Such a train leaves a town in the East, arrives a few days or weeks later, perhaps at Hendaye (on the French-Spanish border), leaves there on its return journey via some French town where it takes on additional patients, and brings them back to Austria where they are delivered to a convalescent hospital. From there, after a short delay, it moves East again where it picks up a new load of valuable human lives in order to carry them back to Germany and convalescence.

And so, again and again, this train makes the cycle from the front to home-land, and from home-land to the front, without interruption.

A thing not known to everybody is how to make subordinates work, and this is of no less importance than one's own work.

—General Kindelan, Director of the *Escuela Superior* of the Spanish Army.

Destroying the German Dams

WING COMMANDER GUY P. GIBSON, V.C., D.S.O. AND BAR, D.F.C., R.A.F.
Leader of the Air Attack on the Eder and Möhne Dams, 17-18 May 1943

The following account is an extract from a lecture given by Wing Commander Gibson before the instructors and students of the Command and General Staff School, Fort Leavenworth, Kansas.—THE EDITOR.

DURING the last war the first thing the British War Cabinet wanted to do was to break down the Eder and the Möhne dams, but we didn't have the equipment. In this war, however, 1942 saw the birth of the Lancaster, but the attack was made in 1943 because the Lancaster appeared too late in 1942. This airplane carries a fantastic load and at last provided the equipment which we had been looking for.

There is only one time you can break a dam. You have three weeks between May 1st and May 30th when the winter rains are causing the water level to rise; but when the dam is full and water is falling out of it, it is too late. You have to have from four feet to six feet of clear concrete to stop the bomb which you are dropping.

I landed after a night bombing raid and was sent for by my air officer who said: "I have a new job for you. I want you to form a new squadron and take them to an out-of-the-way spot, one where you won't see many girls for the next few months. You have to get down to some hard work." Part of it was good; part of it was bad. I was told I was to carry out a special attack. I didn't know at the time what it would be, but knew it would involve a lot of low flying. I said, "Okay." I didn't know where the target was to be. I collected eighteen crews who were the best I could find in Bomber Command. They were a pretty representative bunch: some Canadians, two Americans, two Australians, two New Zealanders, and many English. I had a Canadian navigator, a Welsh wireless operator, and a Scotch rear gunner. We formed together and made an excellent team.

The only thing I knew about this operation was that it would have to be carried out at a low level. We would have to fly around England at fifty feet and around lakes in Scotland. So we went up and down having the time of our lives, because usually one isn't allowed to fly around at that height.

After that they let me in on the secret. Immediately, we realized that we couldn't blow down the dam in an ordinary manner; so I went down to Kent with a group of scientists to study "damology"—the science of destroying dams. This group of scientists, I like to think, included some of the best constructional engineers in the whole of England. They had long studied this problem. They had some theories but they didn't have a government subsidy until I formed my squadron. Then they were told: "You can spend any amount of money you want as long as you get results." So they built up little dams six feet across, composed of little bricks and cemented with talcum powder mixed to form a glue, to produce a model with exactly the same strength factors to scale as the real dams.

They tried explosive charges in the models and took slow-motion movies—600 pictures a second—to watch how they would go off against the side. Then they decided to try something else—mines. With the mines they got better results. They put them in all sorts of positions. These mines were little things about the size of a teacup. Finally one dam broke, so they built a larger dam, 200 feet across and 8 feet high with the same safety factors. The real dam was 150 feet high and 150 feet thick. After many experiments our model dam cracked in the middle and fell away under the water pressure, and most of the water came out. With that information we went up to Wales where the Birmingham County Council permitted us to blow up an old dam which they were replacing with a new one. The attack was successful, and so we knew we could crack the German dams.

But our problem had only just begun. If the attack was to be successful, we had to fly exactly at a predetermined speed and at exactly 50 feet, the reason being that a very special technique of attack was necessary and we had to release within fifteen feet of the right spot. If the mines overshot and hit the end of the dam they would go off and blow us up with them. The right height and the right speed were essential. Radio altimeters didn't work over the mountainous country where we had to fly. In particular, we found we couldn't fly accurately at 50 feet. We tried all sorts of things. First we tried trailing a wire exactly 50 feet long, which, when it hit the ground, lit a red light in the cockpit. This proved a failure when one of the planes actually hit the ground and crashed, the wire being blown straight out behind. Finally my navigator struck on the idea of having two spotlights, one in the nose and one in the tail which would converge at 50 feet below the airplane. The idea came to him one night while attending a burlesque. As the dancer came down the runway and the two spotlights converged on her, he thought, "Why couldn't we use two spotlights, one on the nose and one on the tail, shining downwards, which would be so placed as to converge when the plane is at 50 feet. He explained his idea and we went up to try it out. The idea was that whenever we saw the two beams meet on the ground, we should know where we were. We

went out at night in the Lancaster and tried it out along a canal where it worked perfectly. The navigator had his head out of the window watching the ground and the flight engineer was working the throttles. We then went on with our training which had to be done in moonlight. Unfortunately, we struck some very bad weather which made this impossible, so we had to fly by day and fake the moonlight by fitting our cockpit windows with blue glass and by wearing yellow spectacles which we got from America in three days.

A week before the raid was to take place we had a full scale dress rehearsal up in Scotland. The whole thing was a failure because we had no form of radio telephone control except a primitive set. This set was a terrible thing and didn't work, so we had to improvise quickly and get a new one. Thirty workmen were rushed from London and worked day and night to fit a new VHF radio telephone set in each plane. Next night the rehearsal was repeated and was a complete success. Everyone knew what he was doing, the whole thing went like clockwork, and we were ready to go. Meanwhile the Mosquitos and Spitfires were flying over Germany day by day watching the water rise in the dam until it came to the right level. We also watched the weather and the wind. The making of the mines proceeded at full speed eighteen hours a day, with the result that by the 13th we were ready to go. We had set the 14th as the date to be ready. We actually took off in the evening of the 17th.

For security reasons I will say my base was somewhere in the middle of England, but we set our course from the northeast. One group of nine planes went across the German coast, while my group of nine crossed Holland near Denmark. The Germans knew very well that we were coming, so we dispersed to cause confusion. We flew on across the Rhine. The six who crossed north ran into a bit of trouble. Two hit the flak, were damaged, and had to turn back. Another got his two outside engines shot up and had to fly home on the remaining two.

My nine got through the coast belt all right but we had some trouble with the searchlights which we met in large numbers. They blinded us badly, and one poor chap was so dazzled that he hit the ground, bounced, and ended up a mass of flames. At one time, to avoid the searchlights, we had to fly around the back of a wood. Eventually we got over the target and found it very well defended with guns all the way along the length of the dam and behind it on the hills. I was glad then that we had those dress rehearsals, for in spite of so many distractions we all knew what to do. I went down first to the dam. My Australian bomb-aimer did a good job. There was a terrific explosion and a column of water shot up to about 1500 feet and a tidal wave swept along the lake against the dam, but the dam didn't break by any means. We had to wait and see what had happened, so we scattered into the hills. When things had settled down we came back. No. 2 went in, then No. 3 attacked after a ten-minute interval, and then No. 4. They all placed their mines perfectly; each time they exploded. The crack in the dam became more visible, until No. 5 did a perfect job to finish it off. The dam had tilted right back and this final explosion pushed it over backwards. Out burst over a hundred million tons of water which swept down the valley in a 75-foot wave. The sights to see in that valley were awe inspiring. As I looked down, a car was crossing a bridge. I like to think it was a Luftwaffe pilot out with his girl. The water caught it, and as I watched, the headlights of the car changed from blue to yellow and then to purple as it sank. And then we went on to Duisburg.

My two Australian pilots in the other two Lancasters did a very difficult job very well. They took a long time over it. They flew round and round chatting to each other and discussing who should go in and how. I was sitting up above, telling them to "hurry up." Finally one of them went down and blew a hole in the dam about forty feet across; but this wasn't enough to destroy it. The other Australian then went in and dropped his mine, not beside the other as arranged, but some way along, blowing a hole below the water line. The two together resulted in the dam collapsing along the top. There was more water in this one—two hundred million tons. It swept down the Ruhr Valley doing an awful lot of damage to war factories and wrecking one of the largest airfields in Europe; it had underground hangars and shelters. A very great number of people were drowned by the tidal wave. We didn't at all want to kill so many but we did want to destroy factories, etc., and we succeeded in doing this.

When that was over, the two Australians went back to the Möhne dam where the whole map had been altered. You could just see a great sheet of water. The bridges were sitting up high. I didn't have any more time to look around; it was getting light so I came back very quickly. My flight commander was unfortunate enough to go over some guns on the coast, and he got shot down.

Well, that was the story of the dams. After that we had a party which lasted for two days and two nights; at least, it did for me. Then I started on another job.

The side that runs out of paper first will win the war.—*Anonymous.*

Training Engineer Officers

CAPTAIN J. E. BUCHANAN, *Corps of Engineers*

IN THE shadow of Mt. Vernon, at Fort Belvoir, Virginia, lies the Engineer School. Here, on the same ground where almost two hundred years ago the American Army's first commander in chief got his engineer training the hard way, thousands of engineer officers are getting even sterner training in the working and fighting methods demanded by modern warfare. But they have an advantage which General Washington lacked—the advantage of coordinated courses of instruction based on combat experience and, in many cases, directed by officer instructors returned from hard fighting at various fronts.

Scope of the Training Problem.—In the prosaic language of Army Regulations the purpose of the Engineer School is, among other things, "to instruct and train engineer officers of all components of the Army in the duties of their arm." To appreciate the scope of the problem it is well to recall the variety of engineer duties in our Army. These duties include map making and supply; water supply; constructing landing fields; building fixed and floating bridges; preparing and removing obstacles of many kinds; building roads, railways, ports, pipe lines, and fortifications; and conducting engineer supply. To cope with this array of duties there is a diversity of engineer units for which officers must be trained—aviation battalions, combat battalions, general service regiments, and special units such as topographic, camouflage, water supply, depot, port, forestry, and petroleum distributing. In an emergency, when engineers are utilized as infantry, they attack or defend with essentially the same basic weapons used by infantry. Therefore, they must be thoroughly trained for this duty as well as for engineer work.

Present Operations.—The present program of engineer officer training at the Engineer School is the result of an evolutionary development that has been constantly tuned to variations in the supply of officer material and the requirements of the service. As in schools of other branches of the Army, the training of engineer officer candidates has been a major part of the operations of the Engineer School. In addition to this, the program encompasses basic military training for experienced civilian engineers commissioned directly from civil life, training to convert junior officers of other branches to engineer officers, refresher courses for upgrading engineer officers of demonstrated ability, and advanced training of a specialized nature. Briefly, the current program of courses can be grouped and described as follows:

I. Officer Candidate Course—to produce qualified junior officers. The course lays special emphasis on leadership, weapons, fundamental tactics, and elementary engineering technique.

II. Basic Officers' Course—to give essential basic military training to specialists in engineering and construction who have been commissioned directly from civil life.

III. Engineer Training Course—to convert selected junior officers from ordnance, signal, and quartermaster branches to the Corps of Engineers.

IV. Upgrading Courses:

- A. Company Officers' Course—a refresher course for officers with some previous military training, to bring them up to date in weapons, tactics, and field engineering techniques.
- B. Cadre Officers' Course—a refresher course in engineer functions, duties, and operations for officers from existing engineer units who will be staff officers and company commanders in newly activated engineer organizations.
- C. Field Officers' Course—a course providing training in staff and tactical functions to qualify officers for duties commensurate with field grade.

V. Special Courses:

- A. Course in Attack of Fortified Areas—to train selected officers of all branches of the service to function as unit instructors in assault tactics and techniques.
- B. Camouflage Course—to train selected officers of all branches of the service to serve as unit instructors in camouflage and concealment.
- C. Mechanical Equipment Course—to train engineer officers in the operation and maintenance of construction equipment by engineer units.
- D. Bailey Bridge Course—to train selected engineer officers to serve as instructors in the use of the Bailey bridge.
- E. Course in Mine Field Technique—to train selected officers to serve as unit instructors in laying, passing, and removing mine fields.

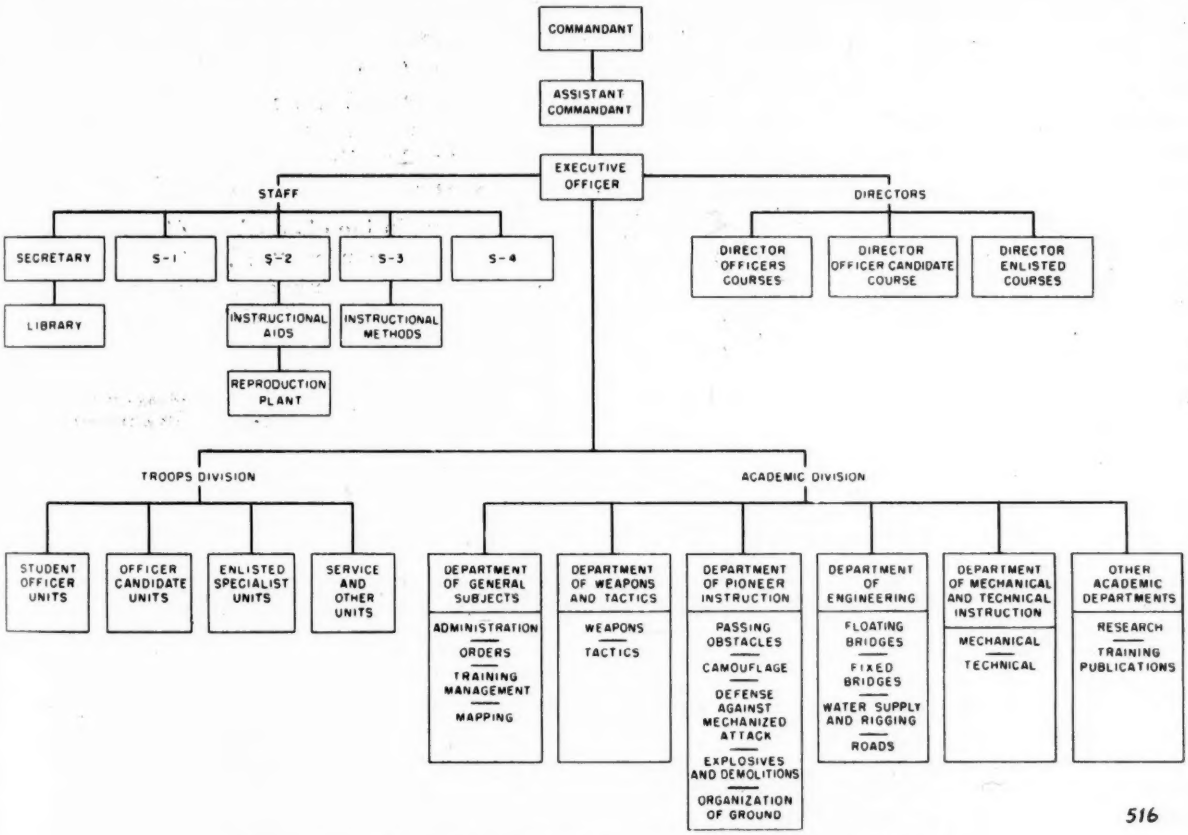
Organization.—The general outline of the Engineer School organization pertaining to officer training is shown in the chart on page 35. Officers and officer candidates are organized into units under a troops division for messing and housing, as well as for

physical training, discipline, drill, and practice in leadership. All instructors of academic subjects are organized into an academic division subdivided into departments and sections in accordance with an orderly grouping of engineer subjects.

Instructional Methods.—Training that will bring success when put to the supreme test of battle is the constant watchword, but good intentions alone are not relied upon. Positive action in various forms is taken continuously to assure results. This includes close supervision and coordination of all classes and instructors. Every lesson is carefully planned as to scope, doctrine, method of presentation, and use of training aids. Not only the lesson plan but also a manuscript covering the subject must be approved. This manuscript, which is a teaching guide, is checked and coordinated to be sure available class time is used fully and efficiently, and all important points are covered. Furthermore, each class is visited frequently by department and section chiefs and by designated staff members. These observers report upon the effectiveness of the instruction and the ability of the instructor, and recommend ways for improving both. All reports are reviewed and summarized by the instructional methods section operating under S-3. Results of these studies give a factual basis for lesson changes, individual help to instructors, and adjustment of teaching assignments.

Every instructor is encouraged to increase his effectiveness as a teacher. He may get help from his section chief, and at any time he may call informally upon the instructional methods section for observation, advice, and assistance. Before newly appointed instructors are given a teaching assignment they are sent to a course in instructional methods, where they practice teaching methods and techniques under the guidance of specialists. Stress is laid on bearing, voice, speech, class discipline, and proper use of training aids.

Believing that the vigor of instruction increases with the physical fitness of instructors, there is a prescribed program of physical exercise for all members of the school's staff and faculty. This includes regular participation in a vigorous competitive sports schedule, or periodically running a cross-country conditioning course within specified time limits.



ORGANIZATION CHART OF THE ENGINEER SCHOOL, FORT BELVOIR, VIRGINIA.

Realism.—Is it practical? Is it realistic? These tests are applied to every element of instruction. Every practicable method of injecting realism is adopted. If any form of instruction is believed impractical it is eliminated. It is a policy of the Engineer School to bring in officers from the various theaters of operations to serve as instructors. Based on battle experience, their realistic views tend to imbue the entire staff with the deadly seriousness of their work. Further inspiration and orientation for

the staff and faculty is provided by a program of conferences with high-ranking engineer officers fresh from action overseas. These sessions impress the necessity of intensive, down-to-earth training. Their approval of training which they have seen prove itself in battle develops confidence on the part of instructors who not yet have been afforded the opportunity of overseas experience. Similar benefit is derived from the presence at the Engineer School of experienced officers of the Royal Engineers of the British Army.

Whenever possible, a class problem or field exercise is related to a realistic tactical situation. This realism is carried into map exercises by frequent use of foreign maps instead of the traditional domestic sheets. Likewise, battle noises and battle conditions are simulated to accustom men to the surprise and confusion that inevitably occur in combat. Another example is in bridge building. After preliminary training, bridges are erected at night, just as they would be in the face of the enemy.

Leadership.—Emphasis on leadership is a vital and realistic part of the course for officer candidates. For the most part these men will be the platoon leaders whose performance will determine the success or failure of engineer tasks in battle. Candidates who exhibit inability to develop this primary qualification are turned back. This attribute of junior officers is considered so important by the Engineer School as to justify the use of a comprehensive system of rating candidates on their ability as leaders.*

Research and Improvement.—Although every effort is bent toward giving the best possible training within the limits of the time available, never is it felt that perfection has even been approached. New ideas and methods gleaned from individuals and intelligence reports are disseminated to the entire staff by the research department. Promising suggestions are tried, and if proved valuable, are incorporated in the school's courses and in engineer field or technical manuals. Trial of new ideas is facilitated by the presence at Fort Belvoir of an engineer replacement training center and of the Engineer Board, much of whose function is experimental. Through the enthusiastic cooperation of the officers and men of the E.R.T.C. innovations quickly are subjected to tests with troops. Similarly, ideas involving equipment are reviewed by the Engineer Board. Thus not only is the infusion of new ideas automatic and continuous, but only those are adopted which are proved practical by test.

Prominent in the office of the director of officers' courses is the reminder: ". . . got to be damned sure no boy's ghost will ever say, 'If your training program had only done its job.' " This spirit permeates the entire Engineer School.

*See "Leadership Rating of Engineer Officer Candidates" by Major William Whipple, Jr., *Military Engineer* August 1942, page 380.

The Navy's Lighter-than-Air Program

NOT one of the thousands of transports and supply vessels that have been escorted by the Navy's new non-rigid airships has been lost to submarine attack by the enemy. Operating in the Atlantic, the Pacific, and the Gulf of Mexico, the Navy's new blimps have proved their worth, both on convoy protection and on anti-submarine patrol, even though their coverage extends only a limited distance from the coast.

During the past year a considerable part of the huge lighter-than-air expansion program has been completed. Twelve squadrons projected for escort patrol duty have already gone into commission. Seven Atlantic-Gulf and three Pacific main bases are functioning. Five bases are in operation outside the continental limits of the United States, and others are planned. In addition to the main bases, numerous auxiliaries are functioning.

The K-type fleet blimps are more than 250 feet long and 76 feet high; the L's are 150 feet long and 54 feet high. The K's have a speed in excess of 60 knots. Depth bombs and machine guns are included in the armament of the craft. Extensive radio equipment is employed.

Advantages of the blimps in convoy and patrol work result from their endurance, maneuverability, and weather-worthiness. Operational flexibility of the new airships is indicated by the recent Navy announcement that one of these ships had successfully completed a 3,000-mile trip to an outlying expeditionary base. The blimp is not handicapped by low visibility as are other aircraft, and it is in effect a movable platform from which anti-submarine operations can be effectively directed. It can float motionless in the air without engine power, or cruise close to the water. It can ride to a sea anchor and pick up objects from the surface or from surface vessels. (From an article in the *Marine Corps Gazette*, October 1943.)

War and the Weather—and the Staff

MAJOR ALBERT E. LINK, *Chemical Warfare Service*
Instructor, Command and General Staff School

ONE OF THE old military platitudes is that an army travels on its belly, but to that we should add, only as fast and as far as the weather permits. The weather has always been important in war, but it becomes increasingly so as mechanization and fire power increase. The machine cannot cover terrain in bad weather like a pack animal; so the Army is more susceptible to the effect of weather than it was in the days before mechanization. The tremendously increased supply loads, with the corollary of increased transport needs, increases the effect of weather in geometrical proportion.

It is all very well to talk of the effects of weather. How to provide for its effects in staff planning is the big question. It does no good just to say, "Well, if it rains our operation will be slowed down." The question is, "Will it rain at the time our operation is under way?" On the correctness of that answer the outcome of many future operations will depend.

In November of 1942 Rommel and his Afrika Korps might have been annihilated but for the weather. On 9 November General Montgomery felt sure he had a trap closing around the Afrika Korps —and then for two days and two nights it poured, the encircling forces bogged down in the mud, and Rommel escaped.

In 1940 a long spell of dry weather permitted the blitz against Poland to roll on, on dirt roads, unimpeded by mud. In 1941 unusually dry weather prevented the Dutch and Belgians from flooding their lowlands and the Nazis found an open road to the west.

At Dunkirk the weather helped the Allies, giving them an unusually smooth sea, permitting even small boats to evacuate 336,000 men to England.

In 1941 heavy snow in October slowed the German drive in Russia. Momentum was lost, never to be regained.

History is full of examples from this and other wars of weather's effect on military operations.

Now as to what we can do about it. We have gone a long way towards having accurate detailed forecasts. In ancient wars the witch doctor was our forecaster. In World War I the weather man could only give us forecasts for a few days, but today the science of weather prediction can do much more. The past twenty years have seen weather predicting make tremendous advances. It is possible today to get a detailed forecast for almost any point on the earth's surface for any given period of time, and if weather records have been kept at that point for a number of years, to have our day-to-day prediction prove correct 65 percent of the time.

Short-range forecasts for one particular area can now be made up to ten days in advance—and will be correct more than 80 percent of the time. Incidentally, in figuring these percentages our weather man is most severe with himself. He only says he was right if he was *absolutely* right.

With the data now available from all parts of the world, our weather man has expanded his field. He can prepare detailed climatic studies for any portion of the earth's surface and so give us a sound weather basis for the planning of future operations.

In our Army, weather study and weather forecasts are a function of the Department of Commerce in cooperation with Army Air Forces. The Signal Corps develops, processes, stores, and issues meteorological equipment. Four specific missions are covered:

1. Furnishing of weather data to AAF.
2. Furnishing of forecasts for one to ten days ahead to Theater Hq, Armies, Corps, and Divisions.
3. Climatic studies and long range predictions.
4. Special studies.

Considering these four missions it is obvious that the Air Forces have a vital need for a special weather forecasting service furnishing specialized data. The speed and range of the airplane make such data vital. An airplane flying 2,500 miles in ten hours must have all available data for all 2,500 miles of its flight. In fact it was the development of the airplane since World War I that forced the tremendous development of weather forecasting.

The furnishing of weather forecasts for one to ten days to theater commands, armies, and subordinate units is of vital importance to all troops in a theater. Weather squadrons operate in each theater of operations and furnish such data. Climatic studies and special studies are being made continually for all present or potential areas where we may operate. Among these special studies are studies on soil trafficability as it affects military operations. These studies are made in the greatest detail and give an accurate picture of the effect of soil and climate on all types of ground military operations.

The technical details of weather forecasting today are most complex. As a basis, the weather man uses data on the movement of air masses and after involved analysis gets his forecast. As with any specialized science a tremendous battery of abstruse technical terms is used, but fortunately the results are expressed in readily understandable terms.

There are certain general statements about weather forecasting that are basic and easily understood. It is easier to predict weather trends in some areas than in others. In the Aleutians, for example, with an average of 180 days a year of fog and 200 days a year with at least 80 percent of the sky covered, it is easy to predict bad weather. In the desert or on the gulf coast of Florida, it is easy to predict clear sunny weather. The difficult thing in such areas is to predict when the weather will not be average, when it will be clear in the Aleutians, when it will rain in the desert.

Climatic studies are of importance. When equipping forces for operations in certain areas, the weather in those areas is a basic factor. Our Weather Directorate has made a detailed study, based on climate, of the type equipment needed by troops going to any area. Reference to this study will help prevent improper equipage of troops.

Besides the effect of weather on our operations, an Army G-2 must carefully consider it as a factor in making his estimate of the enemy's capabilities. Rain will slow down the enemy just as it will slow us.

Our enemy has been most adept at using the weather as an added weapon. Stories circulated at various times have attributed almost superhuman powers to the enemy in his use of the weather. Fortunately those stories are exaggerations. The Germans have been given credit for predicting dry weather in Poland in September of 1939. Actually September is the driest month of the year in Poland! One report may be true, however, in this connection, that the German attack was delayed for some days to await the most favorable weather. Luck very probably was on the side of the German in giving him dry weather for the entire three weeks. He has good weather men, but the science of forecasting does not at present permit accurate forecasts for such a period as twenty-one days.

We know one thing, that the German and the Jap are using the same basic system that we use for forecasting, and that system was, like so many other things, borrowed from outside sources. The Norwegians have been the leaders in developing forecasting methods, and their system is used by our enemies as well as by ourselves. Of course all the belligerents have refinements of methods which are extremely well guarded military secrets, but those refinements are all refinements of one basic system and are not different systems.

It is certain that today we can consider the weather as a potent added weapon. It is a two-edged sword and if we do not use it properly or if we fail to consider it carefully, it can hurt us greatly and may cause the failure of the most carefully made plans. A high wind and a heavy sea could have made our Sicilian landings a failure. The wind died down sufficiently to permit our troops to land.

Any staff officer charged with planning must consider the effects of weather on his plans. The most perfect operational plan is useless if the weather makes its execution impossible. G-3 in his planning must always consider weather if he wishes to avoid failure. G-2 must consider weather carefully unless he wants to run the risk of giving his commander a false picture of the enemy capabilities. We have the means available, on call, in all areas. Unless we call for and then use the available information, we are throwing away a powerful weapon and we may court disaster.

Frankly, the trouble with the weather and its consideration as a factor in our military operations is that it's such a common thing. Since it is always about us, we tend to take it for granted. For that very reason it is absolutely necessary to add "Weather" to the check lists of all G-3's and all G-2's so that we will not forget it.

The Germans also were very expert in improvising booby traps. Officers and men had to be very wary of touching anything on the desert to which a booby trap might be attached. At the time of our visit, a number of officers and men had been killed in this way. As an example of the extreme ends to which the Germans went in devising these traps, a story was told of a British major of engineers who came upon an abandoned German dugout. Across the entrance of the dugout a fine wire had been stretched. The major attached a light string to this wire and backed off, looking for safe cover. Nearby was a slit trench in which he stationed himself and his men. From this cover he pulled the string, and the slit trench exploded, killing the entire detail.

Major General G. M. Barnes in *Army Ordnance* September-October 1943

Principles of Industrial Organization as Related to Military Organization

LIEUTENANT COLONEL R. O. FORD, *Ordnance Department*
Instructor, Command and General Staff School

SOLDIERING is one of the oldest professions in the world. It dates back to the earliest days when primitive men carried a club and went out alone on the warpath. Somewhere along the line a small group of these primitive men found that if they teamed together and did their clubbing as an organized unit they were able to outclub those individuals who operated alone. This marked the beginning of military organization.

Various types of organization developed with the necessity for organized control. One of the earliest records of military organization is in the Bible in the 18th Chapter of Exodus which describes one of the great military exploits of history, Moses leading

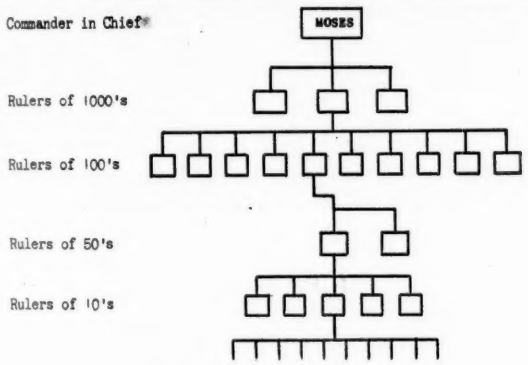


FIGURE 1.

the Israelites out of Egypt. The record reads: "And Moses chose able men out of all Israel, and made them heads over the people, rulers of thousands, rulers of hundreds, rulers of fifties, and rulers of tens. And they judged the people at all seasons; the hard cases they brought to Moses, but the very small matters they judged themselves."

This form of organization (Figure 1), where there is a definite line of command from a commander in chief, through subordinate rulers, down to the individual, is one of the basic types, and is known as the "military" or "line" because of its form and the fact that originally it was associated with military organizations.

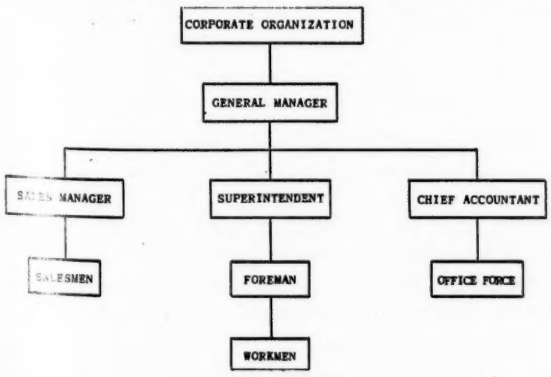


FIGURE 2.

Figure 2 shows this type of organization in simple form applied to industry. The advantages of this type are:

1. Each position has a definite responsibility.

2. No individual is directly subordinate to more than one person.

3. The man responsible for results has the power of discipline.

The disadvantages are:

1. As an organization grows, the men at the top become loaded with too many details.

2. There is no place in the organization to take advantage of the specialized knowledge of an individual.

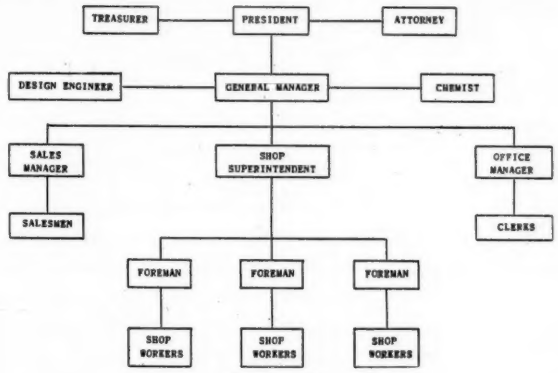


FIGURE 3.

These disadvantages of the line system can be overcome by combining the staff principle with the old form of line organization. This is the second basic type of organization and is known as "the line and staff."

An example of this type of organization, applied to an industrial plant, is shown in Figure 3. The president of the corporation is in charge of all activities. He has a general manager, in the chain of command, who is responsible for the operating departments, but the president has, in a staff capacity, a treasurer and an attorney to advise him on financial and legal matters. Each of these is an expert in a special line, and qualified to assist the president in reaching a decision, but the latter must make the decision and assume the responsibility for it. The general manager, in turn, has the sales manager, shop superintendent, and office manager in charge of their respective departments, and orders from the president are passed on down by the general

manager to them. He also has reporting to him in a staff capacity, a design engineer and a chemist to advise him on problems that will arise in their particular fields. The design engineer, for example, will determine the shape that a particular piece to be manufactured will take, but he cannot tell the shop superintendent to make it in that shape. He will show it to the general manager, and if the latter approves it the drawings will be sent to the shop superintendent with orders to make the piece that way, but it is the general manager's order and not the design engineer's.

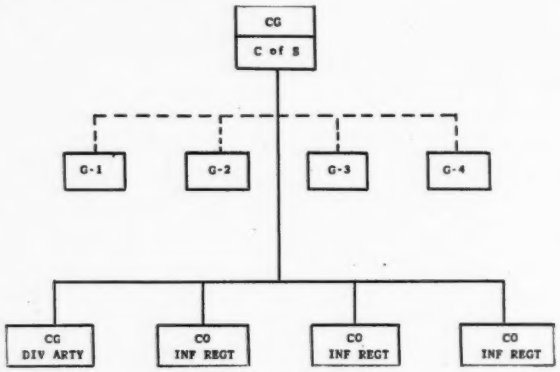


FIGURE 4.

An example of this type of organization in the Army is shown in the organization of the infantry division, Figure 4.

This is an example of the pure line and staff organization. The division commander issues his orders, through the chief of staff, to the commanding general of the division artillery and the commanding officers of the three infantry regiments. Now for the division commander personally and individually to command these four elements would be a physical impossibility. The number of problems coming up to him for consideration and decision would be so great that he could not personally handle them all, and may not have sufficient detailed knowledge of the wide variety of problems to arrive quickly at the correct answer. So he has a staff to assist him. Each staff officer handles the problems that arise in his particular field. If a problem is one regarding personnel, it goes to G-1; if an intelligence question, it is referred to G-2; G-3 handles all matters regarding operations and training; and all supply problems go to G-4. In a way these staff officers are subdivisions of the commander's brain and do his thinking and planning for him. The staff officer considers the entire problem, and then, based on his knowledge and experience, makes a recommendation as to the solution. This recommendation is passed on to the division commander through the chief of staff. If he decides it is a satisfactory solution, it becomes his decision, and it is then passed down the line as an order from the commander.

When the commander has already laid down a policy, the staff officer can make the decision without referring it to him. But even so, the decision still goes out in the name of the division commander. Authority to command and issue orders only follows along the line of the organization, and staff officers in their own name have no authority over subordinate commanders. All orders that they issue must be in the commander's name, and if a staff officer issues an incorrect order the commander must take the responsibility of having issued it himself. His only remedy is a new staff officer.

The function of the staff, either in the Army or in industry, is to furnish expert knowledge to the commander or manager. The function of the line is to execute the policies laid down by the commander after considering the advice of his staff. The difference between the line and the staff function must be clearly understood. The staff is purely a planning and advising agency. Decisions and orders only come from those in the chain of command or line.

The advantages of the line and staff organization are as follows:

1. It separates planning from operation.

2. It gives those in authority an opportunity to use the specialized knowledge of an individual.

3. It maintains the line of authority and responsibility.

The principal disadvantage is the difficulty in getting the proper coordination between those in the line of authority, and those in the advisory staff positions.

In both the Army and in industry, as organizations grow in size, the necessity of specialized knowledge becomes increasingly greater. The third type of organization, known as the "functional," utilizes this specialized knowledge to the extreme.

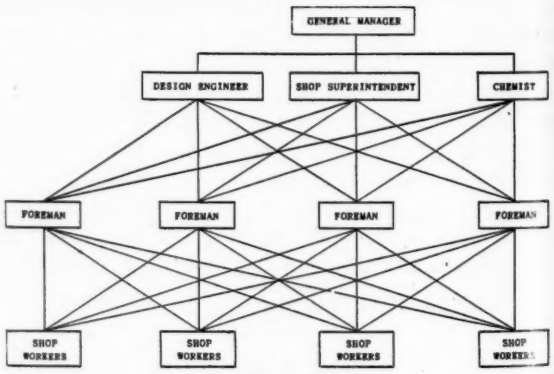


FIGURE 5.

Figure 5 shows the pure type of functional organization for industry. In this type, the general manager, the design engineer, the shop superintendent, and the chemist each gives every foreman instructions and orders regarding their particular phase of the job; and each foreman, as a specialist in some phase of the production process, would give orders to the workman.

This form of organization has a certain amount

of historical interest because it is derived from the one advocated by F. W. Taylor, who is considered the father of what is now termed "Scientific Management." Most organizations which are called functional, actually are a cross between the pure functional and the line and staff types.

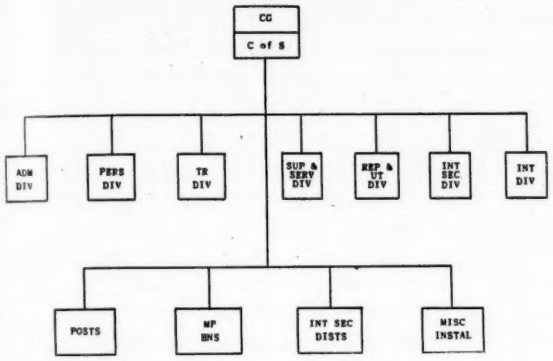


FIGURE 6.

The typical Service Command organization, shown in Figure 6, is an example of a combination of the line and staff and functional types of organization. Reporting to the commanding general are the seven directors of the divisions of the Service Command headquarters. This is organized on a functional basis and the directors are heads of actual operating divisions. However, these division heads also serve in a dual capacity as staff advisers to the commander.

In the Army the tactical units adhere to the line and staff type of organization. The differentiation between chain of command and staff functions is very clearly defined. The Army Service Forces are getting away from this, and the organization is somewhat along the functional lines. This part of the Army, being a business rather than a tactical unit, has found merit in some of the advanced ideas of industrial organization. So we have examples here of the Army selecting the type of organization best suited to do the job on hand.

Quotations from two men with opposite antecedents are of interest in connection with organization.

General J. G. Harbord was an officer in the Army for thirty years, served as commanding general of the Services of Supply in the A.E.F. in France and then became a leader in the business world as head of Radio Corporation of America. He said: "The people of a democracy do not have a very high opinion of the business intelligence, or even of the usefulness, of soldiers until the enemy is thundering at the gates. They forget that through the ages military administration and supply have been worked out from experience. They cannot be separated in the field of actual operations. Civilian business seldom remembers that it has borrowed from the military the basic principles of its own administration, everything, perhaps except certain ethical standards."

General Charles G. Dawes, who was a successful business executive and became a soldier, serving as General Purchasing Agent for the A.E.F. in France said: "Industrial corporations are of comparatively recent growth; the military corporation is the oldest in the world. The fundamental principles governing military operations have not changed; the trade secrets of the military profession are known only to military men and they cannot be understood by civilians. The military corporation has been organized to conduct war and there is no other corporation in the world so well qualified to conduct it. The impelling force behind the industrial corporation is to make something for as little money as possible and to sell it for as much money as possible. The impelling force behind the military corporation is to get a certain thing to a certain place at a certain time, and money is no consideration. The horseshoe nail turned the fate of a nation, not on account of its money value, but because it was not at the right place at the right time."

The Commanding General of the Army Service Forces has established a present-day criterion for all organization: "Does it help win the war?"

If we clearly picture to ourselves the possible and sometimes very lamentable results of such orders on active service, we cannot fail to recognize the fact that the giving of orders is an art which can be learned and practiced, and the only man who will succeed in learning is one who is really in earnest about it, who observes and trains himself by strict and relentless hard work and sets himself a high standard.

—Colonel von Spohn

Motor Marching

COLONEL R. B. EVANS, *Cavalry*
Instructor, Command and General Staff School

GENERAL FORREST condensed a world of wisdom into one very short sentence when he gave his formula for success in battle. The "how" of carrying out his formula can be condensed into one word, "Marching." If you are to "git thar fustest with the mostest," your command, whether it be an infantry squad or an armored corps, must be able to march so successfully that the command will reach the field of battle with the vast majority of its men and machines in *condition to fight, at the proper time.*

You may make a perfect plan for a battle or campaign and gather all the necessary forces to carry out this plan, but if, due to poor marching, you arrive on the battlefield with only a portion of your forces, or arrive too late, you lose the battle. Napoleon was said to have lost the battle of Waterloo because one messenger did not know how to march himself and one horse—he neglected 1st echelon maintenance. Stonewall Jackson won a great many of his battles because his command could march faster and better than anyone thought possible. Jeb Stewart got away with his Chambersburg raid because his command was able to outmarch the northern cavalry. Napoleon, on the retreat from Moscow, lost his Grand Army because the Grand Army had not the ability to march under the weather conditions with which they were faced.

One of the main rungs in the ladder of success of every great military leader of history has been his ability to march his troops better than his opponent.

We all know the facts stated above, or at least we should know them. Yet, when we read the comments put out by the higher headquarters and by high ranking observers on our current maneuvers, we must realize that marching by motors is still far short of perfection in the majority of our units; that a great many of our units still lack that sound knowledge of march principles and technique which will put them there "fustest with the mostest."

In reading over these comments from observers and higher headquarters we find repeated mention of examples of poor marching, such as units parked on the road practically bumper to bumper, after daylight, with no security out and everyone asleep including the officer in charge; units going down the road with 200 to 300 yards between vehicles with the majority of the vehicles going at top speed and half of them down the center of the road, each vehicle on its own and no control by anyone; many instances of units becoming lost at night and even in the day for lack of guards and marchers; many, many instances of entirely unnecessary accidents due to lack of traffic control; units halted on the highways in daylight with no pretense being made to take advantage of cover, concealment, or shadows; and many other instances of a similar nature. If you have followed these comments for the past two years you will know that march technique in our army as a whole has improved, but that there is still a lot of room for improvement.

We all know that these mistakes are not made wilfully, but through a lack of proper knowledge on the part of the officers conducting the marches and of the men participating in them. Marching by motor is a fairly new development in our Army and for a long time there was very little worthwhile written on the subject. As a consequence, motor marches were conducted in accordance with the experience or theory of the officer in charge and many bad practices grew up. Gradually, however, a wealth of experience was built up and Field Manuals began to be written on the subject.

In March 1942, the revised FM 25-10 was published. This manual contained the first really good treatise on the subject that the author was ever able to find, but it covered only noncombatant vehicles, and one had to wade through a great many paragraphs in order to segregate the few essential principles that each and every officer and man should know.

In November 1942, FM 17-50 was published. The first twenty pages of the manual contain practically everything that either officers or men need to know about marching by motor in order to correct all the faults that have been noted on our maneuvers. Although this manual has fairly wide distribution, many units do not receive it at all, and it is a fair guess that a good many who have received a limited number of copies have not taken the time to study it, and therefore do not know how much knowledge on the subject of marching it contains. This manual is of such value that every organization in the Army down to and including the company that has motor vehicles as part of its organic equipment should have a copy and use it as their bible on motor marching. Where these manuals cannot be secured in sufficient quantity to make such a distribution possible, Chapter 1 should be mimeographed and distributed.

To illustrate the point, let us see what the book has to say on some of the mistakes most often seen and commented upon.

"Many units become lost even in the daytime. Many unnecessary accidents happen due to the lack of traffic control."

GUIDES AND GUARDS
(Paragraph 3*b*)

To control traffic, provide for safe passage, and to keep units on the proper route, guides or guards must be stationed at critical points such as road junctions, railroad crossings, and bridges.

(1) *Personnel.*—Military police, motorcyclists of units, and other personnel detailed and trained for the purpose are used as guides and guards.

(2) *Training and equipment.*—Guides and guards must be trained in map reading and traffic control. They should be equipped with flashlights and unit signs as necessary, and when practicable have their own transportation.

(3) *Employment.*—(*a*) There are two general methods for employment of guides:

1. By column commander.—In this method, guides march near the head of the leading unit of the column and are posted by the commander of this unit or a specially designated officer or noncommissioned officer. They remain where posted until the entire column passes and then follow the column. When guides are not provided with individual transportation a truck or other vehicle must follow the column to pick them up. This method requires more guides than in the method described in *2* below. However, it has particular application when the march is by infiltration.

2. Unit guides.—In this method each march unit or serial has its own guides, each guide having his own transportation. The leading unit of the column posts guides at critical points. A guide remains at his post until relieved by a guide from the next succeeding unit and then moves to rejoin the head of his own unit. This method is practicable when the close or open column type of marching is used. It is not practicable for infiltration as the march unit will be too long for guides to rejoin the head of their units. Each unit should have its guides precede it so that contact with the unit in front can be maintained and its guides relieved promptly.

(*b*) Guards are placed at bridges where reduction of speed is necessary and at railroad crossings. At railroad crossings guards may be men from the march unit who operate the same as guides as described in (*a*) *2* above. Guards at bridges are usually established by the column commander.

(*c*) Where traffic control may be difficult, an officers' control post is established.

(*d*) Guides should be carefully instructed as to the route. They must know their location and should know the units that constitute the column.

Elements leaving column (Paragraph 4*f*).—If for any reason a march unit or one of its elements leaves the column, the commander thereof will notify the commander of the next following unit or element. Failure to do this may result in a part of the column becoming separated without the knowledge of the column commander and thus jeopardize the tactical employment of the column as a whole.

A great many of the adverse comments can be summed up in one phrase, "poor march discipline."

MARCH DISCIPLINE
(Paragraph 4*e*)

(1) March discipline is defined as that quality, acquired through training and experience in marching, which insures adequate march control; care of equipment; obedience to march restrictions; proper conduct and performance of duty by individuals; correct formations, distances, and speeds; and effective use of cover.

(2) The rapidity of motor vehicle movements necessitates a high state of individual training and march discipline. Control is difficult and much of the responsibility for a successful movement rests with subordinate commanders. Much reliance must be placed upon the judgment of the individual members of the vehicle crew.

(3) March discipline includes—

(*a*) Proper distance between march serials or between march units.

(*b*) March units clearing roads at a halt.

(*c*) Proper distance between vehicles.

(*d*) Halting in appropriate localities.

(*e*) Halting or moving on schedule.

(*f*) Knowing the route of march.

(*g*) Few accidents.

(*h*) Establishing traffic control at a halt.

(*i*) Alertness on the part of car commanders and drivers.

(*j*) Assisting flow of traffic, both civilian and military.

(*k*) Driving on the right of the road.

(*l*) Maintenance of proper speed.

(*m*) Shifting gears promptly.

(*n*) Gaining momentum when coming to a steep grade.

(*o*) Proper loading of vehicles.

(*p*) Dimming lights.

(*q*) Using arm or other signals for all changes of speed or direction.

(*r*) Giving signals correctly.

(*s*) Personnel remaining concealed when required.

(4) Infractions of the above can be traced to the faulty and inadequate training of individuals and of the small basic elements of the command. Active supervision by the subordinate leaders and commanders will check such faults. Subordinate commanders should "ride the column," constantly observe march discipline during movement, and make prompt correction of violations of march discipline.

(5) Personnel will not be permitted to ride on the outside of vehicles, such as on top of tanks, on running boards, or on hoods. They will not be permitted to ride in such a manner that arms, feet, or legs are

hanging outside a vehicle. These practices are not only unsightly and unmilitary, but frequently result in serious injury to personnel.

"Units halted on the road, in daylight—no one knowing why nor for how long. No effort made towards cover nor concealment. No security detachments out."

HALTS
(Paragraph 5*a*)

(1) The order for the march will provide for halts at stated regular intervals to provide for relief of men and for inspection of vehicles. Usually a halt of 15 minutes is made at the end of the first 45 minutes of marching. Subsequent halts are for 10 minutes and are made at the end of 1 hour and 20 minutes or 1 hour and 50 minutes. The halt for lunch and refueling is usually of 45 minutes to 1 hour duration. The time for the halt is taken from the time leading vehicles of the march unit stop (not when the commander dismounts) until that vehicle resumes its forward movement.

(2) If the commander of a march unit finds that the time for the scheduled halts will place his command in an unsuitable location, such as a town, unsuitable strip of road, or bridge, he should halt ahead of or behind schedule. Normally a leeway of 1 minute either way for a march unit will not disrupt a march column. If required to continue through a congested area, the commander of a march unit can keep going until a halted unit ahead forces him to stop.

(3) If for any reason the column commander decides to halt at other than the specified times, the march units must be promptly notified of the halt and of its duration.

(4) On administrative marches it may be desirable at halts to require the vehicles of each march unit to close to 5 yards' distance. The march units do not close on the preceding march unit. This closing-up of vehicles within the march unit facilitates the inspection of vehicles, issuance of instructions, and correction by platoon and company commanders of errors noted. The closing-up of vehicles within the march unit may in some cases facilitate the passage of traffic en route. *On tactical marches the vehicles do not close at a halt.*

(5) When coming to a halt, vehicles move well over to or off the right side of the road. Traffic control guards, equipped with flags, are posted at the head and rear of the march unit to control passing traffic. Where necessary, intermediate guards will be posted so that adjacent guards are in view of each other. Personnel, other than those used for traffic control, keep to the right of the vehicles. Engines are shut off.

(6) Drivers, especially of full-track vehicles, should be changed frequently. Halts offer an excellent opportunity to make this change. Changes of drivers should not be limited to an exchange of duties between drivers and assistant drivers, but should include all members of the crew. This is especially true on a very long day's march and on marches of several days' duration.

(7) Halt areas for meals must be properly policed prior to departure.

(8) In moving out from halts, speed should be attained gradually. A suggested method is as follows:

First minute at 10 mph.
Next minute at 15 mph.
Next minute at 20 mph.
Gradually to 25 mph.
When halting, the procedure may be reversed.

(9) (*a*) At halts, full advantage must be taken of any available concealment such as trees, shadows cast by buildings, and shadows adjacent to a large cut or fill. During tactical marches, vehicles may be closed in small groups to obtain cover and concealment, but there should never be less than 50 yards between vehicles. (See FM 17-30, 17-32, 17-33, and 17-42.)

(*b*) If no natural cover or concealment is available at halts, resort should be made to the use of vehicle camouflage nets or other forms of camouflage, and vehicles should be widely dispersed. They should not be halted in lines or columns.

(*c*) Upon halting, immediate all around defense is established, observation posted, and air and gas alarm warning is provided with each march unit. At least one man must be in the vehicle manning the vehicular weapon.

A good many of the errors made can be directly traced to a lack of proper control and supervision by the commanders of all organizations down to and including the platoon.

CONDUCT OF THE MARCH
(Paragraphs 4*a* and 4*b*)

Position of commander.—(1) The commander has no fixed position during any march. His place is where he can best influence the movement and keep himself informed as to the conditions existing throughout his command.

(2) When the unit is marching in one column, the commander is usually between the head of the main body and the tail of the advance guard. However, he should by personal observation or staff inspection, acquaint himself with march conditions throughout the column.

(3) When the unit is marching in multiple columns, the commander goes where he believes his presence is most needed. If a hostile attack may be expected from a flank, he should be with or in the proximity of the threatened column. If hostile contact is expected toward the front, he should be well forward.

(4) Commanders of serials and march units usually march at the head of their units. However, they should make frequent inspections of their column.

Control.—(1) For administrative marches in peacetime the commander usually has at his disposal every advantage and facility for planning and conducting a march. For control he uses radio communication, motorcycle and motor messengers, and guides and signs posted by route reconnaissance detachments. The designation of phase lines assists in control.

(2) In the campaign, higher commanders may impose a radio silence in order to obtain surprise in the use of armored units and for secrecy. This radio silence may obtain in bivouac, on the march, and in assembly areas.

(3) The use of motorcycle and other forms of motor-borne messengers in training and in campaign is necessary in order to habituate commanders and troops to this form of transmission of orders and of control and to supplement the radio. A motorcycle or other mounted messengers may be quicker and more dependable than radio for distances of 5 to 10 miles. This is predicated upon the use of continuous wave radio in a net with several other stations and upon the availability of good roads.

(4) The commander or his designated representative controls and leads the march of the column or serial. He establishes the rate of march to which all elements conform and acts as a pace setter. He maintains a uniform rate thereby eliminating jamming-up or elongation within the march unit. Each subordinate commander conforms to the rate set and maintains contact with the unit next in front following that unit at the prescribed time interval.

Although no particular adverse comments on night marching have been seen recently by the author, the paragraphs on this subject are so good that they can well stand quoting in this article.

NIGHT MARCHES
(Paragraph 4*o*)

(1) Armored units will frequently march at night to avoid air observation and attack. Also the threat of a hostile mechanized attack may cause armored units to march at night. Marches in the combat zone are usually made at night. Night marches will be used frequently when secrecy or surprise is desired and to avoid long-range interdicting fires.

(2) Night marches require careful and thorough planning. When hostile observation is active, night marches may be made without lights. When it is desired to march at night without lights, it is better to begin the march without lights or turn lights out at a halt and permit drivers' eyes to become accustomed to the darkness before moving out than to turn the lights out while the column is moving. Marching on dark nights without lights materially reduces the rate of march of any column. It will vary from 5 miles per hour on poor roads and across country to 10 miles per hour on good roads. When marching at night with lights or in bright moonlight without lights, the rate of march is about the same as marches in daylight.

(3) To maintain close contact and communication between and within march units, distances between vehicles are reduced during night marches. When hostile air attack may be expected, it may be desirable to dispatch groups of about five vehicles with minimum safe distances between vehicles and maintain an average density of about 20 vehicles to the mile. The particular advantage of this method of night movement is, that should the column be attacked, only a small part of the command would suffer losses. This method of movement is predicated on the march objective being secured by friendly troops.

(4) As night marching under the most favorable conditions is difficult, the following measures should receive careful attention during the planning and conduct of the march. These points have equal application irrespective of the type or method of marching employed:

(*a*) Issue warning orders.

(*b*) Make adequate preparations.

(*c*) If practicable, start the march at dark so all preparations may be made during daylight hours. However, secrecy may require the march to start after dark and that all movement, both on route and in bivouac, cease prior to daylight.

(*d*) Allow sufficient time for completion of the march during the hours of darkness.

(*e*) Thoroughly reconnoiter and mark the contemplated route, and in addition reconnoiter alternate routes.

(*f*) Provide for guides to be posted at points where troops might take the wrong route, to assist troops through congested areas, and at the new bivouac or other march objective.

(*g*) Provide for security detachments to cover critical points or areas. This may include antiaircraft and antimechanized defensive measures.

(*h*) Provide for adequate communication between march units and between march columns when moving in multiple columns.

(*i*) Take full advantage of good roads.

(*j*) Use lights if the situation permits.

(5) During night movements without lights, great care must be exercised in the use of flashlights and other lights. Smoking is prohibited. Any vehicular lights must be so disposed that their beams are not disclosed to air or nearby ground observation. Night driving lights should be used. A shaded light may be placed well under the bed of a vehicle in such a way that the light shines on some surface painted white or other light color. Flashlights should be equipped with a blue lens, or the ordinary lens covered with blue denim, blue cellophane, or other suitable material.

(6) When rapidity of movement is important, driving with lights may be necessary. Normally such

a situation would be of short duration and under circumstances where hostile reaction would be too slow to delay the movement or affect the employment of the unit.

The other paragraphs of Chapter 1, FM 17-50, which have not been quoted are equally clear and to the point. If every organization in the Army that contains motor vehicles as part of its organic equipment had available the subject matter contained in Chapter 1 of FM 17-50, if the principles and technique contained therein were taught to all of its personnel, and if its officers exercised the necessary supervision to see that what had been taught was carried out, most of our troubles encountered on motor marches would quickly disappear. Poor marching can and will cause the needless loss of many lives. Good marching will save those lives and win battles.

The German Soldier

[From a speech by General Montgomery reported in the *Sunday Express*, London, and reprinted in *Britain*, British Information Services, New York, October, 1943.]

THE GERMAN soldier is a very good fighter, and it is a great mistake to suppose that he is finished and that the war will soon be over. He is not finished at all. The German general is a first-class, highly trained professional soldier, and he is particularly good if you allow him to do what he wants to do.

The German soldier is a very good fighting man, and he has three characteristics that stand out. First, he is very good technically in handling his weapons. He is very good with his tanks, and also very good is the German organization for keeping his tanks in action, for picking up damaged tanks on the battlefield, for repairing them and getting them back into action again.

Secondly, the German soldier has a very good eye for country and the reason for that is that as children they play their games as military games. In those games they take up military positions and the result is that the German soldier has a very good eye for country which stands him in very good stead in battle. He is quite first-class in making the best use of the ground he finds himself in.

The third point is his complete and absolute obedience. He obeys because he does not know what is going on, and he obeys blindly. Early in the pursuit battle we captured a German soldier at some crossroads at Mersa Matruh. The intelligence officer asked him what he belonged to and what he was, and his reply was: "I do not know. I was flown over here from Vienna and I was told to stay at these crossroads and here I am."

I would say that the chief difference between the German and the British soldier is that the German soldier laughs at other people's misfortunes while the British soldier laughs at his own misfortunes. The German soldier cannot stand up to really heavy concentrated artillery fire combined with air bombing, and that is one way in which we can do him in.

The German soldier is inclined to become a little stupid through over-indulgence in sun-bathing, and, in a country where the sun can be hot, we have noticed that the soldier was becoming definitely muddle-headed. The German soldier is not the strong, robust sort of man that people think he is. The sick rate among the Germans was always far higher than it was in the Eighth Army. He suffered a great deal from rheumatism and stomach complaints and was not as healthy and fit as the average British soldier.

The big battle-winning factor is morale, and the side whose troops possess the higher morale will win, other things being equal.

The science of a general-in-chief amounts to this: to have on a set day, at a given point, as many men as possible. Napoleon said it, and Napoleon was a judge.

—Captain Elzéar Blaze in *Recollections of an Officer of Napoleon's Army.*

The Control Officer in the Army Service Forces

MAJOR L. DECEW, *Corps of Engineers*
Instructor, Command and General Staff School

SEVERAL years ago one of the nation's largest industrial corporations took stock of itself. It had, without any preconceived plan, annexed numerous small plants and companies to its structure which originally had been sufficient. Enlarged thus haphazardly, the efficiency of the corporation became poor, and there was need for an overall study and redesign.

This corporation called upon a firm of management engineers for such a study of itself. That firm brought to the problem a specialized knowledge of administrative technique and analysis, and a broad overall viewpoint which personnel actively engaged in the routine operations of the corporation could not have. And, after a two-year study, it recommended a radical change in policy, a rearrangement of organization, and a revision of procedures.

The Army Service Forces is like that corporation, except that its rate of growth has been many times faster and its need for continuous maximum effectiveness of performance many times greater. There is no time for two-year studies. The Army Service Forces must continually study itself as it grows, examine its accomplishments, and make immediate changes to improve policy, organization, and procedures as required. Because of that necessity for continuous survey of itself, it has established its own firm of management engineers by organizing what are called "control offices" in its large headquarters and installations. The word "control" was used by Henri Fayol in 1918 in describing administration. He said that administration has five phases, as follows:

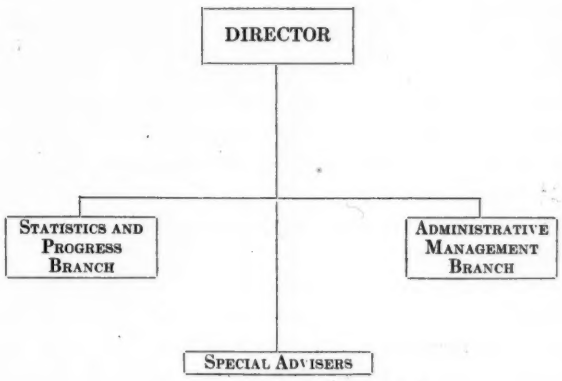
1. Planning—determining what is to be done and how. (Fayol used the term "prevoyance" which includes forecasting as well as planning.)
2. Organizing—building up a system of working relationships.
3. Commanding—supervising and giving instructions.
4. Coordinating—seeing that work is not done to cross-purposes.
5. Control—evaluating accomplishment of the plan.

Note that the word "control" is used here in a sense dissimilar to the dictionary meaning. Control in administration does not imply restraint.

The responsibility of an administrator includes responsibility for all five phases of administration. But, being engaged in everyday routine duties, administrators have little time for extensive control studies, and their evaluation of accomplishment will probably not have the proper perspective with reference to the overall plan of the organization. A separate control office augments and supplements the administrators' control. This office performs no routine operations and never gives orders. It is a group of specialists in management with the sole function of control. It has an overall view of the organization and can see how the operations of each section tie in to execute the mission of the whole organization.

In the Army Service Forces, another function has been assigned to its control offices in addition to the statistical function as stated by Fayol. That additional function is the examining of performance and determining ways to improve performance.

Control offices are now established at Army Service Forces headquarters, at each Service Command headquarters, and in large depots and ports of embarkation. Their internal organization consists of two major branches, one concerned with the function of evaluating accomplishment and the other with the function of examining performance and determining methods to improve performance. The titles given to these branches vary, but all are similar to those shown below in the organization diagram for the Control Division at Army Service Forces headquarters.



The Statistics and Progress Branch, as its principal duty, shows statistically the progress of the organization as compared to established objectives. In performing this duty, it supervises reporting procedure in the Army Service Forces, determining what basic records are required to supply the desired information and eliminating all unnecessary reports.

The Administrative Management Branch has for its main purpose the undertaking of studies of policy, organization, and procedures, and the initiating of

changes tending to increase the effectiveness of performance throughout the Army Service Forces. It does a great deal of this work in cooperation with control offices in the lower echelons and with the operating services.

Special advisers, who are individual specialists, are appointed from time to time to work on special problems, or groups of similar problems, which require concentrated attention and study. Survey teams are also used for the same purpose. A survey team is made up of two or more officers, one or more from the Control Division and the others usually from the unit in the organization which is being surveyed. After obtaining all information relating to their problem, they report the facts and submit recommendations for improvements. Their reports will include the necessary directives to put the recommendations into effect, prepared for the commander's signature should he approve.

In most instances, however, directives are not necessary. It is better control practice to reach agreements with the chief of the unit being studied and adopt improvements as determined during the progress of the survey. Only those recommendations upon which agreement cannot be reached with the operating unit are presented to the commander.

The duties of the control officer can probably be better explained by describing some of the activities of the Control Division at Army Service Forces headquarters. One of its major accomplishments has been its studies leading to the reorganization of the Army Service Forces and the Service Commands. From a group of organizations and miscellaneous activities that had been accumulated in the War Department, there was constructed one simplified organization wherein relationships and responsibilities are definitely outlined, and authority is decentralized to the maximum extent, regionally down to Service Commands and posts. An organization manual was published to show just what each unit had to do and to whom it reported. Analysis and redesign of organization will be a continuing task of the Control Division as the Army Service Forces grow and as one task replaces another in importance.

Another major accomplishment of the Control Division has been its complete reorganization of the reporting system in the Army Service Forces. It has replaced innumerable routine and special reports with approximately twenty-five reports which are prepared by the technical services and Service Commands. From these, the Control Division makes up two monthly summaries, one a series of progress charts and the other an analysis of overall progress. Virtually all statistical information required in Army Service Forces headquarters is contained in these reports.

Simplification of procedures is the purpose of many of the activities of control offices at all echelons. One example is found in W. D. Circular 75 (1943), the result of studies sponsored and supervised by the Control Division at Army Service Forces headquarters. This one circular now contains the entire instructions for handling salvage for all services and obviates the former necessity of consulting fourteen or fifteen regulations and manuals. Studies in progress are intended to accomplish a similar simplification of supply procedures.

One major activity presently under way is the Program for More Effective Utilization of Personnel. This program was initiated in March of this year by a series of directives from the Chief of Staff to every post, depot, and other installation in the Army Service Forces, asking recommendations to effect the following:

a. Elimination of non-essential records.

b. Elimination of non-essential activities.

c. Elimination of duplications, overlappings, and conflicts in authority.

d. Decentralization of authority to lower echelons of command.

The recommendations called for are sent to the Control Division at Army Service Forces headquarters through channels. But no higher headquarters can "kill" them en route. It can only comment, favorably or otherwise, in its indorsement. In this way suggestions are coming directly from the people in the field who are actually performing the basic operations. An immense amount of detailed work is performed by the Control Division in carefully considering each recommendation, discussing it with the agencies involved, and initiating measures to adopt those approved. Many of the adopted recommendations require changes in Army Regulations. About 5,000 recommendations were received in this program and practically all of them have been disposed of. About 60% have been adopted to date. An example of the saving in effort resulting from this program is furnished by one situation wherein certain posts were able to reduce the number of reports they submitted to one agency alone from 112 to 28.

Probably the most effective means the Control Division is using to bring about maximum utilization of personnel are its work analysis studies, intended to simplify routine operations within the Army Service Forces. These studies are in progress at all posts and installations and, in the beginning, have generally been confined to major routine operations in offices. The principal method of analysis used is the process chart, wherein the successive steps in an operation are shown graphically, using four symbols:

a. The large circle representing a work operation.

b. The small circle representing transit from one work place to another.

c. The triangle representing waiting.

d. The square representing inspection or verification.

For example, these four symbols, connected with

a line as shown, might represent such an operation as this:

a. A clerk fills out a form.

b. The clerk takes it to a supervisor's desk.

c. The form lies in a basket on the supervisor's desk.

d. The supervisor inspects the form.

After every successive step in an operation has been charted as explained above, the entire operation can be readily analyzed. Useless practices not realized before will often be brought to light and logical short-cuts will be suggested. About 5,000 of these work simplification surveys have been completed throughout the Army Service Forces, and actual experience has shown that, on an average, 10% of the personnel requirements can be reduced through these surveys. Illustrating how performance in individual cases can thus be increased in effectiveness, one section, by cutting down nonessential steps which were brought out in process charts, increased its daily output of work 220%. From these process charts, a model flow chart adopting the most efficient procedures can be developed as a standard for all offices of the same type. In discussing work simplification, General Somervell said, "We have started the biggest drive to improve management that there ever has been in the whole history of this country. And I think we should be awfully proud. I do not know anything like it that has a parallel anywhere."

The foregoing description of some of the activities of the Control Division at Army Service Forces headquarters is applicable to control divisions at Service Command headquarters, but of course in a more limited scope.

Organization, for example, is a subject on which the Service Command Control Officer is often consulted, particularly in connection with posts. Also, he eliminates unnecessary reports and holds new reports to a minimum by a requirement that requests for new reports must clear through him.

He is responsible for compiling information from the operating divisions at Service Command headquarters, and from posts, into the monthly progress reports of the Service Command. He analyzes the information in reports. He would, for instance, determine causes for sudden increases shown in reports of overtime employment, telephone traffic, etc.

The Service Command Control Officer administers the Army Service Forces Program for More Effective Use of Personnel in his area. He is usually the liaison officer between the Service Command and the local section of the War Department Manpower Board, which is studying the utilization of personnel throughout the Army.

Among other activities of the Service Command Control Officer have been studies to improve handling of correspondence, filing, and message distribution in the headquarters; to eliminate duplicating administrative operations at large posts where there are several "exempted" activities; and to provide a unified Military Police force for Army and Navy personnel in cities and on trains.

At ports of embarkation and large depots, control activities follow much the same pattern as has been described above for the administrative field. They include, also, studies to improve stevedoring and warehousing operations, plant layout, etc.

In summary, all control activities in an organization can be classified under two functions—(a) evaluating accomplishments, and (b) examining performance and determining ways for its improvement. Control officers act only as specialists, assisting the commander to carry out his control responsibility. They never engage in routine operations and never give orders. They initiate improvements preferably as cooperative undertakings rather than through pressure. Properly performed, theirs is a perfect example of a pure staff job.

The Control Division at Army Service Forces headquarters publishes a Control Manual in three volumes: I, Fundamentals of Control; II, Basic Principles of Organization; III, Work Simplification. A fourth is being prepared on the subject of statistical reporting. These books are excellent texts in administrative management, and the writer is indebted to them for much of the information in this article.

Regard your soldiers as your children, and they will follow you into the deepest valley; look on them as your own beloved sons, and they will stand by you even unto death. If, however, you are indulgent, but unable to make your authority felt; kindhearted, but unable to enforce your commands; and incapable, moreover, of quelling disorder; then your soldiers must be likened to spoilt children; they are useless for any practical purpose.

—Sun Tsu on *The Art of War*, about 500 B. C.

Tank Destroyer Battle Experience

Prepared for the MILITARY REVIEW under the Direction of
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THE HARD-HITTING Tank Destroyers, the United States Army's answer to the Nazi panzer threat, have proved themselves in battle, according to reports received from the combat fronts.

Recognized as a definite need in 1940, the subject of experiment in 1941, and emerging as an entity in December of 1941 when a training center was temporarily set up at Fort Meade, Maryland, the TD's today are filling a gap in our military plan with well-trained and equipped troops from the big Tank Destroyer Center at Camp Hood—Texas' largest military establishment.

Like other components of the ground forces, Tank Destroyers have not been confined to any one particular theater or to any one front. They have been spread around the globe and used to advantage whenever employed. Their first great test, however, was in the Tunisian campaign where armored forces played a particularly important role. It was in Tunisia that the TD's hacked out for themselves a reputation for straight-shooting, aggressive battling, and it was there that the Nazis and Italians came to call them the "American Tourists" (because of the extensive traveling they did to meet armored thrusts) or the "Quarter-inch Bastards" (because of the light quarter-inch armor on the M-3 half-track destroyer).

IN THE SOUTH PACIFIC

Tank Destroyers were in on the beginnings of the big fight at Bataan and Guadalcanal. Fifty M-3 destroyers (half-track-mounted 75's) were sent to the Philippines in the summer of 1941. They fought effectively against the Japanese invasion force, knocking out light Japanese tanks, defending beaches, and acting as mobile artillery. An observer who was evacuated during the last days of Corregidor stated that the Nipponese could not have landed at either Lingayen or Lamon Bays had a sufficient force of TD guns been available to defend the beaches. This same observer believed that the TD's figured prominently in prolonging the defense of Bataan beyond the tenth day.

M-3 HALF-TRACK DESTROYER

Used by the 701st TD Battalion and by the majority of the TD units in Tunisia. The M-3 was an expedient destroyer, designed to give the TD's a mobile, flat trajectory gun while more suitable destroyers were being produced. The M-3 functioned extremely well despite its limitations.

Despite the poor terrain conditions for armored warfare on Guadalcanal, the United States Marines used M-3 Tank Destroyer half-tracks on various missions in that theater. Under orders to support defense of the Matanika River against a Japanese counterattack, the Marines moved their M-3's into firing positions. Twelve Japanese tanks led the assault across a sand spit at the mouth of the river just at dusk. At a range of less than a hundred yards, the self-propelled 75's destroyed ten of the tanks. The leading tank tried to maneuver and escape the devastating fire. It ran off the sand spit and into the river, disappearing with its crew beneath the surface of the water. The last tank succeeded in crossing the spit but was destroyed while trying to make its escape down the beach.

ACTION IN AFRICA

Tank Destroyer Units played an important part in the invasion of Africa. Mobile, possessing great fire power, the units were found to be an ideal weapon for landing operations and were used as integral parts of task forces during the entire campaign.

Tank Destroyers accompanied the first landings in Algeria on 8 November 1942. They were part of a combined force which landed at St. Leu Beach and moved in with the flying column whose mission was to seize the Tofaroui Airport. Their use as self-propelled artillery and assault guns unquestionably played a big part in the action which secured this vital installation necessary for the establishment of landing fields. Without these fields, there would have been little fighter support for the American advance on Oran.

TD's were among the first American units to enter Oran and also accompanied the leading American elements on the long trek to Tunisia. Units of the 701st TD Battalion, attached to the First Armored Division, took the enemy town of Gafsa in southern Tunisia early on the morning of 21 November 1942, probably firing the first American shots

against the Axis forces in Tunisia. Likewise, in the closing stages of the campaign, other Tank Destroyer Units accompanied the first American troops to enter the town of Bizerte.

One of the most important aspects of the Tunisian campaign was the fact that this was the trial by fire, a proving ground for the theory that a hard-hitting, self-propelled, straight-shooting gun, whose vision was better than the tank's, was one of the answers to the destruction of hostile armor.

The first few months in Tunisia were a trial for all American troops. Our units found themselves faced with the task of cooperating with the French and the British in an effort to hold a long, thin line from Mateur down to Gafsa, a line behind which the Allied strength could be built up to move in and put the squeeze on the Axis from the south and west, while the British Eighth moved up from the southeast.

As a result, our organizations were split up and assigned to various points of the front to meet current needs and to reinforce the French and British. The TD's were used to bolster points vulnerable to

M-10 DESTROYER

The M-10 is a later model, now in use. The three-inch gun has high velocity, flat trajectory. Fifty caliber MG is primarily an AA weapon, also available for ground fire.

enemy armored thrusts at Faid, Fondouk, Pichon, Ousseltia, and in other sectors. These early battalions, equipped with the expedient M-3 and the later model, the M-10, proved themselves on the field of battle and earned for all times a reputation of being able to do the job rapidly and well.

In Tunisia TD units performed not only their primary mission, the destruction of hostile armor by direct fire, but were also assigned to, and performed, missions as mobile artillery, rear guard actions, flank guard actions, general task force reconnaissance, airport defense, advance guard, and divisional protective screen actions.

In retrospect, it is remarkable that the tank destroyers functioned as effectively as they did. Of necessity, they operated with French, English, and American units and were assigned to all types of missions. They performed creditably in all situations and, despite the heterogeneous assignment of tasks necessitated by the tactical situation, they were generally successful in the completion of their mission.

Company "B" of the 701st was cited by the French and by Allied Headquarters. The entire unit was awarded the French Fourragers, and the commanding officer received the Croix de Guerre with Palm. Another TD Battalion was credited by General Terry Allen with turning back the German 10th Panzer Division and protecting the First Infantry Division's flank and supply lines at El Guettar. Individual decorations and citations were numerous. Allied commanders, especially French, were eager to secure Tank Destroyer support, and those TD units available were assigned and reassigned frequently, over many sectors. One battalion was attached to as many as nine separate headquarters throughout the campaign, under several of which it functioned more than once.

INDIVIDUAL ACTIONS

On 22 December 1942 Allied Force Headquarters cited Company "B" of the 701st TD Battalion for actions engaged in during November. The citation reads: "A unit of outstanding courage in battle . . . it has accomplished by skilful maneuver and exceptional daring, in less than two days, the recapture of an important locality occupied by the enemy, the destruction of a strong armored column which attempted the recapture of this locality, and the capture of a motorized column which threatened its flank."

The honor was hard-earned. Company "B" had just come overland from the vicinity of Oran after completing several successful actions there. Arriving in Feriana, Tunisia, late at night after a long march, it was ordered to attack the enemy-held town of Gafsa at dawn. The mission was accomplished with the aid of two antiquated French reconnaissance cars and two P-38's, acting as air support. The company seized Gafsa before noon and took a number of prisoners and a quantity of enemy matériel. At noon the commander received word that an enemy armored column was approaching Gafsa from the east. The Tank Destroyer moved out to meet the Panzers and surprised them at El Guettar. When the smoke cleared from the battlefield, four enemy tanks were found to have been destroyed, with six escaping back toward Gabes where they were later captured, out of fuel and considerably damaged. The company commander used a "play" which had been practiced on the drill field until all concerned were letter-perfect in its execution. When action was imminent he called the play, and the practical application of the drill field was applied to the bat-

tlefield. Nothing was left to battlefield inspiration. The action depended on the perspiration which had been expended on the drill field for its successful execution. This is a practical application of the principle of applying the lessons learned on the drill field to the battlefield.

Returning to Gafsa, the company was ordered to Sbeitla, a hundred miles to the north, where the Germans had captured the town along with two companies of French infantry and large quantities of matériel. Leaving Gafsa at dusk, the company marched fifty miles to Feriana, refueled, and started the thirty mile trip to Kasserine at dawn. The panzers had advanced as far as Kasserine and turned back. The country was strange, the TD's were unsupported, and maps were sketchy and some were even incorrect.

The company advanced cautiously through Kasserine and surprised the enemy eating the noon meal at Sbeitla. Flanking the town, the company again used a play which had been practiced on the drill field and poured a heavy, accurate fire into the fourteen tanks on the outskirts of the town. Eleven enemy tanks were destroyed and three escaped. One destroyer was disabled temporarily and one man wounded. Prisoners were again lined up, civilians interrogated and released, and booty seized. After French forces had garrisoned the town, the company retired to Kasserine, where it got its first sleep in four days. In the past thirty hours it had been in three actions, won them all, destroyed fifteen tanks, captured six, and traveled four hundred miles—not a bad beginning for the first Tank Destroyer Unit in action in Tunisia.

Tank Destroyer Units carried their load and played an important part during the withdrawal of American forces through Kasserine Pass in February. Rommel was attacking through Faid Pass and Sidi bou Zid, pushing the Allies back along a wide front. Retiring American forces fought a delaying action at Sbeitla to cover withdrawal through Kasserine. Destroyers, attached to armored units during this action, played their part.

Dawn of the 17th of February found destroyers of the TD Battalion some distance in front of supporting forces, holding a broad front. Just before noon some sixty enemy tanks approached. Sixteen panzers worked their way around the left flank using a covered route of approach. Shortly thereafter the Tank Destroyers took the hostile tanks under fire, destroying seven. During the fight the enemy tanks closed in to approximately two hundred yards before retiring out of range. Units of the 701st TD Battalion were also engaged in rear guard action during this withdrawal.

A Big Kill at El Guettar

One of the most decisive Tank Destroyer actions took place at the battle of El Guettar on 23 March 1943, when thirty-one guns of a TD Battalion destroyed over thirty enemy tanks of the Tenth Panzer Division, disabled others, and inflicted heavy losses on German infantry.

Attached to the First Infantry Division, the TD Battalion was placed in front of the defensive position occupied by the division southeast of El Guettar village. The TD mission was to protect the division artillery and to prevent tank counterattacks.

The division was to attack on the morning of the 23d. However, at 0500 TD reconnaissance parties, entrenched in the valley in advance of the division defense, captured a German motorcyclist, part of the advance guard of the Tenth Panzer Division. General Allen's division was warned that the Nazis were attacking. Until this time no more than fifteen or twenty enemy tanks had been reported in the sector.

The panzers attacked at dawn, thrusting at the TD positions and the artillery emplacements with over a hundred tanks. One force of thirty tanks hit the American right flank with the intention of cutting through and severing the division supply lines to Gafsa. The panzers were turned back, leaving four dead tanks and towing four disabled Mark IV's. In the American center and left flank the tanks attacked in lines and in groups of six. The TD companies there fired from defilade, shifted positions, dodged 88's and enemy infantry, and knocked out tanks as fast as they could load and fire. At noon what was left of the panzers retired, and an infantry attack was launched by the Nazis in the late afternoon. During this attack, the German infantry advanced in the open, standing upright. The tanks reappeared but remained in the background, milling and raising dust with no intention of advancing.

The TD Guns used HE in direct fire on the infantry, inflicting heavy losses. Divisional artillery laid down concentrations, and the attack was broken. The Nazi force retired toward Gabes, terminating their activities in that sector. General Allen was high in his praise of the Tank Destroyer Battalion. It had helped hold the front line under heavy attack by three times its number of tanks, and had successfully withstood strafing and dive-bombing by the Luftwaffe, sniping, machine-gun and mortar fire from infiltrating German infantry, and concentrated German artillery fire. Twenty-one of their thirty-one guns were disabled, though eight were recovered and repaired at once. Personnel losses were comparatively light.

General

These few examples of Tunisian actions indicate that Tank Destroyers aided materially throughout the entire campaign. Among the first to join battle, they played equally important roles in the final stages of the crushing of the Afrika Korps. Other actions, too numerous to mention and chiefly concerning individual platoons and companies, have

been recorded. The lessons learned have been translated into new training and are now an integral part of the fast-growing TD tactical dossier.

The general conclusions drawn from the Tunisian experiences show that the Tank Destroyers employed their flat trajectory, high velocity weapons with unusual accuracy both in direct and indirect fire missions.

Battlefield experience has proven that the development of the Tank Destroyer, initially the M-3 and then the M-10 and now a new and improved weapon, has justified its existence. Their record stands for itself: in Tunisia, tanks destroyed, 137; 88's knocked out, 18—a conservative estimate from available official records.

Offensive Spirit in Defense

[Translated at the Command and General Staff School, Fort Leavenworth, Kansas, from a German article in *Hamburger Fremdenblatt* 17 May 1943.]

THERE is no soldier who does not prefer violent attack to silent, stubborn defense. But war does not ask what a person would like. Defense which saves forces is often the necessity of the hour, and the commander who could not depend on his troops' resistance as much as on their force of attack would be in a bad way. The German soldier, although conditioned by temperament and training primarily for strongest forward movement, has also proved his superiority by masterly conduct of defense in the most recent phases of the war. It has thus been confirmed that all good characteristics of the German fighting man acquired during generations and all the basic principles of military training and development tested through the decades hold true in defense just as well as in offense. And finally it has become evident that certain tactics of defense may very well make use of many elements of offensive tactics. Defense conducted on mobile lines does not dampen offensive spirit; for it demands daily, as the culmination of defense achievement, a new counterthrust which often seeks to penetrate the enemy's position and even his assembly areas.

Defense requires just as high ability of the soldiers as does attack. It demands highest development of psychological forces; for it is clear that, while the spirit of attack is promoted by the impetus of forward movement, stability and resoluteness in waiting can be nourished only by almost inexhaustible will to victory when positions are held only with difficulty against a foe confused, perhaps, but numerically superior and as a rule with strong reserves at his disposal.

This resoluteness and confidence in victory is unshakable in our soldiers, for it is based on a sure feeling of personal superiority which has been proved to be justified against every enemy in all theaters of war and under all conditions of land and climate. This is not only, not even primarily, a matter of training. The enemy also knows how to use weapons and move skilfully in the terrain. Excellence of weapons, also, is not decisive, though it is very important. Basically, the decisive thing is consciousness of one's own worth, which causes the will to assert itself at any cost. Therefore the grenadier is ready and mentally able to wait in his trench when hostile tanks rush forward. He lets them roll past in order to be able to grapple with the hostile infantry following, and he knows the steel giants will soon be taken care of by heavy defensive weapons farther back. Thus the gunner behind the machine gun is able to let the dense wave of attacking hostile infantry come up within a few paces and then annihilate it more effectively with the dense sheaf of his fire. It would take only a slight jamming at the decisive moment for him to be overwhelmed by the attack, but he does not think of that. He controls his heart and imposes iron calm on himself because he knows how strength increases with resoluteness.

Of this spirit is born the battle tactics of men against tanks. Where, for some reason, antitank weapons are lacking in a sector of the front, the infantry might well feel itself unprotected and abandoned. It is far from that. The infantry attacks the enemy and, as we know from hundreds of reports and statements, it lays him low. Perhaps this example is best suited to show the strength of German defense: Two or three men stalk the hostile tank while others attract the attention of the tank crew. They jump onto the steel monster and adjust a pole charge to the tread in such a way that the vehicle is smashed to fragments a few seconds later. They tear open the turret hatch; and, perhaps with only a pistol in their hands, they force the crew to climb out and surrender. They are resourceful and audacious. They have not slackened in defense but have remained active, as in the days of violent advance.

The German soldier will also prove himself in the future both in attack and defense. The success of defense is not less important than that of attack. The aim in both cases is the weakening of the enemy until final victory.

This is a "Night War"

COLONEL WILLIAM L. ROBERTS, *Infantry*
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ALTHOUGH military history is replete with examples of night operations, the present war is becoming more of a "night war" than any in the past. Night operations have always served to economize manpower, to achieve surprise, and to offer certain advantages through the cover afforded by darkness. The principal reason for the present increase in night movements, however, is to be found in the development of the airplane with its strafing and bombing of marching or bivouacked troops and its very great extension of "the eyes of the army." Any daylight movement in an active zone must take the chance of being seen and harassed from the air. As a result, more and more operations are carried on at night and nearly all movements in an active zone are now made under cover of darkness.

Fighting and moving at night are so important that *a unit unpracticed in these should be labeled unsatisfactory for combat.* Many of our combat officers are still ignorant of the principles and methods of planning and conducting night operations both large and small, and an inspector responsible for determining the readiness of units for combat might well use as his yardstick a problem in the preparation and execution of a night exercise.

After troops have been "blooded" with two or three night missions, usually with comparatively few losses, their morale goes up like that of good commandos or rangers. They realize that, though night attacks mean hard labor in preparation, the small casualty list is a sufficient recompense.

The Russians have conducted numerous night attacks in the present war with excellent success, employing all arms including tanks and cavalry. The British in the African desert found that neither the Germans nor the Italians had a liking for night attacks. The New Zealanders were particularly adept at operating in darkness and came to prefer it, but they found that continual practice was necessary. Acting on their findings, they practiced and rehearsed night battle drills throughout the pursuit of Rommel from Alamein to Tunis; and this practice served them well, for near El Hamma one New Zealand brigade was ordered to deliver a night attack on five hours notice—and the attack was delivered.

Among the night operations that stand out in American history, Anthony Wayne's storming of Stony Point in the Revolutionary War should be familiar to us all from our history books. The feat of the 2d Division in November 1918 is not so well known. The division initiated a night march in two columns with the object of marching through the German lines. One of the columns was successful and, with German-speaking doughboys in the lead, stopped on its objective a good march inside the German lines and promptly bedded down. When morning came the men collected prisoners right and left, assisted adjacent divisions during the day, and prepared for another march at dark. The march of the previous night was repeated and served more than any other one thing to bring our army quickly to the Meuse River. A study of this night operation might serve to inspire others to attempt this method of penetration, with expansion and exploitation at first light.

Night attacks are usually skilful and inexpensive actions on a limited scale using the darkness as concealment in order to take positions that would be too costly in daylight, to exploit or complete a success, to attack a numerically superior enemy, or to capture prisoners. In order to take a limited objective with economy of force, such attacks must be characterized by simplicity and surprise. They must be preceded by a high degree of coordination and executed with the greatest cooperation. No two night attacks are alike, and troops preparing for such attacks usually feel that their problem is most unusual. Each attack has a different problem to solve, each attacking force has different troops and weapons that must be coordinated, and in each case the enemy is organized and disposed differently. Therefore, every night attack must be planned as a special operation, although in all of them there are certain broad principles that must be followed.

Training for night operations should start early. It should be included to a small degree in basic training and should be at its height at the end of the first six months. Much can be accomplished at first in daylight, with exercises later being undertaken at dusk, then in moonlight, and finally in the blackest night. City-bred soldiers are quite unused to complete darkness at night but even they quickly become used to it. The eyes must be trained to see at night. Small units can be trained by night patrol and night infiltration activities, and by such simple exercises as moving in a certain direction for a specified distance in the dark. Accurate fire is difficult after dark and efforts must be made in our training to develop our own effectiveness in this respect, and at the same time to take advantage of the fact that the enemy's fire will be poorly aimed. Sometimes in night attacks only bayonets are used in order to prevent nervous trigger fingers from acting too soon and thus losing the element of surprise.

British Training Notes has this to say with regard to night training: "Whenever possible, all units must carry out night training at least three nights a week. A continuous week of night work is strongly recommended. At first all personnel must be taught how to move, observe, and listen at night. All units must

be able to operate on dark nights as well as when the moon is bright."

In organizing a night attack the staff must consider every detail with the greatest care. Everything must be done to make sure that the troops leave the position correctly, that surprise is gained, that timing is clearly understood, and that supporting fires are closely coordinated. The troops that are to make the attack must be informed well in advance and orders must be issued early so that officers and men may be thoroughly prepared both physically and mentally. Whenever time permits, rehearsals should be conducted on similar terrain in rear areas. Before the attack is launched complete information must be at hand concerning the enemy and the terrain. This should be obtained by reconnaissance patrols preferably made up of men who will later take part in the attack.

When the attack is once under way, many difficulties will arise for which provision should be made in advance. In the darkness, sight liaison will be lost and the need for silence will make it difficult for leaders to exert all their influence. As a result, closer formations will prevail than would be the case in a daylight attack. Control and communication problems will arise so frequently that only units thoroughly trained for night operations will be uniformly successful.

The determination of the distance traveled after leaving the line of departure often presents a serious problem. This has sometimes been solved by detailing pace-counters or "navigators."

The loss of direction at night can quickly turn success into disaster, and great care must be taken to insure that this does not happen. Advantage can frequently be taken of the moon and stars, and use has been made of searchlights as guides or landmarks (backsights) for orientation. In some cases the British have used tracer bullets fired from 40-mm antiaircraft guns along the flanks of their units to give a constant boundary. The New Zealanders have outlined their objective by means of phosphorus shells. It is believed that parts of the battlefield could be illuminated by four-minute flares dropped from airplanes, and such illumination could be controlled and maintained with no great difficulty.

When the attack objective is reached and the position is captured, it must be quickly consolidated in order to repel the enemy counterattack which will probably develop at dawn. The plan of the attack must provide sufficient time before daybreak for this consolidation and for digging in. If enemy mechanized units may be expected to take part in the counterattack, the consolidation of the position must include the digging in of antitank guns and the hasty preparation of minefields.

The lessons of numerous night operations, ranging from raids by a few men to operations by comparatively large forces, indicate that the use of the following methods contribute to success:

Allow plenty of time for preparation.
Make careful preliminary reconnaissance.
Plan fire support carefully.
Rehearse.
Use all arms.
Arrange means by which individuals and vehicles may be distinguished.
Protect the flanks.
Assure the suddenness of the attack.
Have a clearly marked line of departure.
Advance in a straight line.
Advance on a visible landmark.
Avoid noise, smoking, and lights.
Divert the enemy by sham actions or feints.

The following is quoted from a recent report of the commander of an armored division in Africa: "Practically all marching is accomplished at night although in several instances tanks moved into position boldly in daytime under air strafing and artillery fire without any great damage. Mine removal was habitual at night by engineers. Our infantry was successful in capturing hostile positions at night. On several occasions the infantry crossed open ground under artillery observation at night to avoid casualties. On one occasion tanks attacked with infantry at night to regain a lost position. While the fire of tanks was ineffectual the morale effect of the noise and firing was of great assistance to our own infantry and lowered the morale of the enemy. The possibility of using tanks in night attacks should be carefully considered as it has great advantage if the terrain will permit."

Whenever the use of tanks at night is mentioned, the tankers hold up their hands, saying, "It's dark enough in daytime and at night we can see nothing, let alone aim our weapons!" However, in many instances in the present war tanks have been employed successfully at night. On one occasion the American Army in Tunis employed them with success, the British and the Germans used them when the moon was full, and a whole British armored division attacked on the blackest night at El Hamma. Tanks frequently move at night, both on roads and off (usually with guides), in order to be in an attack position at dawn. They may similarly be used to follow up a night attack by infantry to be prepared to attack at daybreak, and with artificial illumination it is believed that tanks will hold their direction and fire nearly as well as in daylight.

Since night operations are becoming a "must" for all units, all units must be prepared for them. Any unit that is not trained to move and fight at night is not completely trained; it lacks some of its necessary equipment. And it is obvious that the arms that must be trained are not only the infantry, the cavalry, and the artillery, but *all arms* including armored units.

This is a "night war." Let's go!

The Action Around Jevszek

LIEUTENANT COLONEL (NOW FIELD MARSHAL GENERAL) ERWIN ROMMEL, *German Army.*

The following article was translated at the Command and General Staff School, Fort Leavenworth, Kansas, from Field Marshal Rommel's book Infanterie Greift An *which was published in 1935.*

It is interesting to read of Field Marshal Rommel's activities against the Italian Army in 1917 during World War I when, as now, his enemy was his erstwhile ally.

This account is from the section of his book entitled "Attack at Tolmein" (Tolmino, Italy) which at that time was near the Austro-Hungarian-Italian border. Rommel commanded a detachment of seven companies. With three light machine-gun squads, he forced the surrender of 37 officers and 1,600 men of the Italian Army.—THE EDITOR.

WITH THE units of the Württemberg Mountain Battalion located near Luico, I [Rommel] hurried back to our road block north of Polava where I reorganized my detachment, consisting of seven companies, and divided the captured pack animals among the various companies. Without taking time for rest we started climbing in the direction Jevszek-Cragonza, for we felt that an immediate attack would catch the enemy unprepared.

In spite of the tremendous exertion and privations of the past few days, we soon gained altitude in the steep, trackless terrain that went up partly over long meadows and along impenetrable thorn hedges, partly up through stony draws. Once again I had to demand superhuman efforts from my exhausted troops, for the offensive had to continue.

The ascent became more difficult the higher we climbed. Deep gullies and thorn bushes forced us to make detours which usually resulted in a loss of height and in increased expenditure of energy. We climbed for hours; twilight fell and then darkness. The troops were totally exhausted. Did I relinquish my objectives? No, Jevszek had to be reached and once there I knew I would still find enough brave men to storm Mount Cragonza.

The great disk of the moon shone brightly on the roof-steep slope, silvered the grassy surfaces and bushes, and threw long black shadows on the end behind the groups of trees. The point climbed slowly and carefully and finally found a narrow footpath. The detachment followed at fifty yard intervals. We halted occasionally and listened into the night for any telltale noise.

Once again we halted in the shadow of a haystack close to the narrow path. A densely overgrown ravine lay in front of us and dark shades were uncanny. Our path went through it. We listened intently and we heard the hum of voices, commands, and the noise of marching troops coming from the far side. The enemy was not coming any nearer, but was moving laterally on the far side of the ravine. We thought he might be in position over there and the narrow footpath was our only means of approach. The situation was none too inviting. I figured that Jevszek and Mount Cragonza were up ahead and to our right, and under these conditions, I preferred to turn off the path and move off to the right. The point worked its way up the steep slope in the shadow of the long rows of bushes. Before us lay a large grassy field, brightly illuminated by the moon and surrounded in a semicircle by tall trees. Was it an illusion? Were those obstacles at the edge of the wood? Were there enemy positions behind them on the edge of the wood? We crept forward with utmost care and found that we had not been deceived. And then we heard Italian voices in the woods to our front. Unfortunately we were unable to determine whether or not the enemy had already occupied prepared positions. To make certain I sent out several officer reconnaissance detachments. Meanwhile the detachment closed up and rested. Soon the report arrived that the enemy was preparing to occupy the positions in front of us, and that the obstacles in front of the position were very high.

To attack that fortified position uphill across the brightly illuminated surface was most daring even for completely fresh troops. With the exhausted mountain soldiers, who had accomplished real wonders since the start of the offensive, such an attack, even in the next few hours, was impossible. Moreover it was still debatable whether a breakthrough at this place in the early part of the night would be useful and could be sufficiently exploited. I gave up the idea, decided on several hours of rest, and undertook a very thorough reconnaissance of terrain and enemy.

Without a sound I moved the detachment into a broad draw which offered protection against fire from above, and was some three hundred yards from the enemy position, and made provisions to rest until midnight. The 4th and 2d Companies secured the bivouac by posting sentries in a semi-circle. Since the captured pack animals made themselves unpleasantly conspicuous by whinnying, they were tethered considerably lower down. During the movement to the resting place, very violent combat (Note: The 1st Battalion of the Bavarian Infantry Life Guards had run into an Italian position.) broke out in the valley near Polava, which indicated that hostile forces were still in the valley.

Other officer scout squads were sent to reconnoiter favorable avenues of approach into the hostile posi-

tion, the strength of the obstacles, their depth, possible guns, the type of garrison, and the location of the village of Jevszek. They had to report back by midnight at the latest.

I went to sleep just above the detachment in a captured Italian sleeping bag which my hard working orderly Reiber had filched from one of the captured mules. In spite of exhaustion my nervous tension made sleep impossible. As early as 2230 the following excellent report of Lieutenant Aldinger brought me to my feet.

"Jevszek is half a mile northwest of our bivouac area. The town is strongly fortified and equipped with wire entanglements all around, but as yet does not seem to be occupied by the enemy. On the slope just west of Jevszek, as well as through the south part of Jevszek, Italian troops are working downhill in a southeasterly direction.

My decision was quickly made: "On to Jevszek!" I hoped to reach the town ahead of the Italian garrison intended for it. It only took a few minutes to break camp, pull in our security elements and get the companies ready to march. Meanwhile the moon set; the night was dark with the stars furnishing a dim light.

The detachment climbed noiselessly toward Jevszek on the path reconnoitered by Lieutenant Aldinger. The leaders were briefly instructed as to the situation. The 4th Company and 3d Machine-Gun Company formed the advance guard and the other five companies followed at short intervals. First we crossed a narrow bit of wood, then we climbed steeply up the mountain through forest glade. The point soon reached some six-foot obstacles. Lieutenant Aldinger announced that we were only three hundred yards from Jevszek. We halted and listened intently for minutes into the darkness. Nothing moved in our immediate vicinity, but some 100 yards upslope we heard the tread of descending Italian infantry.

Lieutenant Aldinger slipped through the narrow passage in the wire into the position behind it and found it empty. The point followed. I then moved the entire advance guard in and disposed it in a semicircle inside the hostile installation. Scout squads were sent out to explore the immediate terrain and to reconnoiter against the enemy on the slope and the village of Jevszek.

At the same time the bulk of the detachment (2d and 3d Companies, 1st and 2d Machine-Gun Companies) moved through the obstacle and into the position. I left the signal company and the pack-animal detachment on the slope outside the obstacle.

With a scout squad I worked my way toward the enemy up the slope. Our visibility was only a few yards. The slope in front of us appeared as an uncanny, black mass. A bare hundred yards away the Italian infantry was moving along, probably in column of files, from the right down toward Jevszek on the left. We crept closer. Suddenly we were challenged by a hostile sentry. That was the setup. The enemy was in position, with a column in movement to his rear.

We crept back and turned to the left toward Jevszek. As we reached the first houses, a scout squad returned with the report that the north part of Jevszek was free of the enemy but that Italian infantry was marching through the south part of the village. I decided to move into Jevszek with the purpose of capturing the infantry in the southern part.

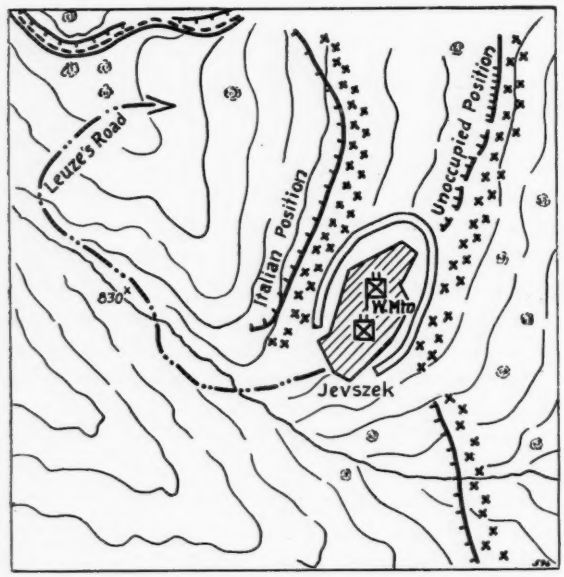
A few minutes later the detachment moved slowly forward toward the town. The foremost units had just reached the first houses when the dogs in several farms began to bark. Shortly afterwards the enemy opened fire from a position on the slope up to the right and about 100 yards away. The volley luckily struck mainly in the forest to our left. Not finding cover, we flattened ourselves on the ground, our machine guns and carbines ready for fire, but remained absolutely quiet. The opening of fire from our side was out of the question unless the enemy attacked. If he did not attack, which I considered possible, then he would soon cease firing thinking he had made a mistake.

During the firing, units of the main force moved into Jevszek under cover of the unoccupied positions east of the town. The enemy's fire died after a few minutes and my detachment was soon in the town. Happily, no losses resulted from the hostile fire attack.

I occupied the north part of the town in a semicircle, avoiding any further encounter with the enemy on the slope just to the northwest of Jevszek. Midnight was long past. Those not on sentry duty or in position rested on their arms in the houses which were still occupied by Slovene families. We all knew that we were only a hand-grenade's throw from a strongly-occupied Italian position, and that we would be engaged in hand-to-hand fighting at any moment should the enemy feel his way into the town.

Since the firing the march of hostile forces on the slope northwest of Jevszek and through the south part of the village had ceased. Besides, the enemy had fired on us only from the slope to the northwest and not a single shot came from the southern part of the town. This raised the suspicion that there might be a gap in the enemy's position which we thought was continuous as far as Polava. By the flickering light of an open fire in one of the houses I studied the map thoroughly. We were about a mile north of Polava in the northern part of Jevszek at about twenty-eight hundred feet elevation. Mount Cragonza was six hundred yards to the west and nine hundred feet higher up. Since Jevszek was fortified on the east side, and the enemy was in position on the slopes northwest of Jevszek and southeast as far as Polava, we were dealing with an Italian rearward position prepared long ago with the aim

of blocking a penetration through the Luico pass. The hostile movements detected by us during the night led us to believe that the Italians were making every effort to occupy this position. Judging by the type of fortification, Jevszek itself doubtlessly belonged to this position. For some reason the garrison destined for Jevszek had not arrived. We had to await its arrival at any time. Should we wait? I felt that the God of War was once more offering his hand to our courageous mountain troops. I believed that our seizure of Jevszek had given us a portion of those hostile positions which were to block our way and that of the Alpine Corps toward Mount Cragonza, the Mrzli and the Matajur.



After these considerations, I told Lieutenant Leuze to go and see if the southwest part of Jevscek was free of the enemy, in which case he was to extend his reconnaissance to the ridge six hundred yards northwest of Jevszek and in the rear of the Italian forces in position just northwest of the village. He was to return in two hours. Lieutenant Leuze declined assistance and moved off alone.

The exhausted detachment was given another rest period. The bulk of the unit sat, within a few yards of the enemy, before the hearthfires in solidly built houses, consuming coffee and dried fruit, which were offered us by the very friendly Slovenes. An occasional shot was heard outside, followed by an Italian hand grenade burst. The enemy evidently lacked any desire for a reconnaissance thrust toward Jevszek. We did not fire a shot. Complete darkness enveloped the German and Italian forces so closely opposed to each other.

Toward 0430 Lieutenant Leuze returned from his reconnaissance with an Italian captive, and reported: "The southwest end of Jevszek is free of the enemy, the path to the height six hundred yards northwest of Jevszek has been reconnoitered; I captured this Italian on that hill, but otherwise failed to meet the enemy." He had splendidly fulfilled his mission.

Leuze's report led me to decide on an immediate occupation of the hill six hundred yards northwest of Jevszek with four companies, leaving the remainder of the detachment in Jevszek as support. I planned to attack the enemy northwest of Jevszek at dawn.

This was not an easy decision. If the enemy used his commanding positions on Mount Cragonza to pour fire into ours, then we would have been faced with a fight on two fronts. The results would have been bad. But nothing ventured nothing gained.

It was still pitch dark when, at 0500 the 2d and 4th Rifle Companies and the 1st and 2d Machine-Gun Companies silently left Jevszek and took the path reconnoitered by Leuze. Lieutenant Leuze led at the head of the long file column. I left the 3d Company and 3d Machine-Gun Company under the tested Lieutenant Grau as support in Jevszek with the task of pinning down the garrison of the position northwest of Jevszek by fire as soon as we attacked. Their subsidiary mission was to protect us from an attack from the east.

I gave these orders while the detachment was moving out of the village. When I later joined the column of the 2d Machine-Gun Company, it was getting light on Mount Cragonza. In the mountains the change from night to day takes little time. I had the uncomfortable feeling of being a half hour too late. In front of me I saw my companies climbing Hill 830 in the usual file column among jumbled boulders in the bare hollow. The uppermost crags of Mount Cragonza were already bathed in bright light. I studied them with the glass and became alarmed! Enemy positions were located a few hundred yards above and to the left of my detachment. They were occupied and I could even see the helmets of the garrison. If the enemy opened fire, the hollow in which the detachment was located at the moment offered little cover and heavy losses were unavoidable. At this moment the responsibility for the lives of my officers and men weighed very, very heavily on me; I had to extricate them from the danger of which they were oblivious.

I gathered as much of the 2d Machine-Gun Company as was possible and emplaced it on the left with instructions to cover and pin down the enemy on the slopes up on the left with fire as soon as he began to shoot. Then I hurried forward with the runners and turned the heads of the various companies to the right toward the height overgrown with single small bushes six hundred yards northwest of Jevszek. It was high time; dusk was giving way to daylight.

As the last units of the companies left the hollow, the enemy on the Cragonza covered the detachment with heavy rapid fire. We were still on the slope facing the enemy and the fire came from a commanding position. There was no protective cover. Only

low thorn bushes in various places offered the possibility of at least withdrawing from the enemy's sight. Under the quickly initiated fire support of the 2d Machine-Gun Company the various platoons split, gained the height six hundred yards northwest of Jevszek, and took up the fight from there.

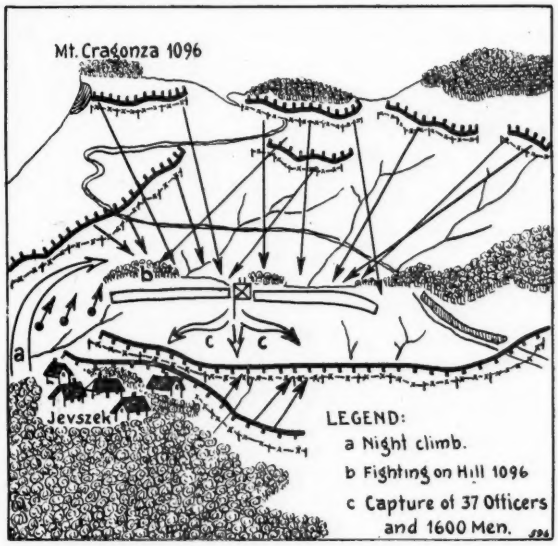
But we were not equal to the powerful superiority of the hostile fire directed against us from a semicircular position on the heights in the northwest, west, and southwest. By creeping laterally and making short rushes, the men of the 2d and 4th Companies tried to separate and reduce the effect of the hostile fire. Losses mounted. Among others, the fine leader of the 2d Company, Lieutenant Ludwig, was seriously wounded.

Meanwhile to our rear the battle in Jevszek had flared up. According to orders, the 3d Company and the 3d Machine-Gun Company under Lieutenant Grau had taken the enemy northwest of Jevszek under fire, pinned him to his positions and prevented him from attacking the rear of the other companies.

With a few combat orderlies I reached the hill six hundred yards northwest of Jevszek where I found cover against aimed fire in a small group of bushes. The machine guns banged away on all sides. I no longer had as much as a squad in reserve. Everyone was engaged in the violent fire fight and was shooting as rapidly as possible. I had to make a quick decision or lose my unit. Through my combat orderlies I had three light machine-gun squads gathered together from the front line of the 2d and 4th Companies and brought to the protecting slope sixty yards east of my command post. With these men I formed several assault teams and led them downslope in the rear of the enemy located in position just northwest of Jevszek with a front to the east and who was being subjected to our fire.

We went downhill through the bushes with our machine guns and carbines at the ready and we soon saw the hostile position below us. It was heavily garrisoned, helmet next to helmet. From above we looked down on the bottom of the trench. The enemy had no cover against our fire. Above us whistled the fire intended for the mountain troops on the hill six hundred yards northwest of Jevszek. Down below and near Jevszek we saw the 3d Company and the 3d Machine-Gun Company firing on the Italians just three hundred feet below us. The enemy did not suspect what threatened him.

The assault squads made ready and we shouted down to the hostile garrison and told them to surrender. Frightened, the Italian soldiers stared up at us to the rear. Their rifles fell from their hands. They knew they were lost and gave the sign of surrender. My assault squads did not fire a single shot. But not only the garrison of the positions between us and Jevszek, about three companies strong, surrendered, but, to our great surprise, the hostile trench garrison as far north as the Matajur road laid down its arms. It had been completely confused by the fierce noise of battle in its rear and by the appearance of the weak assault squads on the northeast slope of the hill six hundred yards northwest of



Jevszek. The fire fight between the Italian garrisons on Mount Cragonza and the greater part of the Rommel detachment probably meant to the enemy that the Germans were attacking in the direction from Cragonza and had already occupied their commanding heights.

An Italian regiment of 37 officers and 1,600 men surrendered in the hollow seven hundred yards north of Jevszek. It marched up with full equipment and armament, and I had trouble finding enough men to carry out the disarmament. Meanwhile the battle raged on some three hundred feet above with undiminished violence.

The Italian garrison on Mount Cragonza knew nothing of the activities in the vicinity of Jevszek and it continued to attack my front line. But our rear had been cleared.

In the Military Science there is something more important than weapons—more important than men—it is time.

—Napoleon

Organization

[Extract of an article, "Troop Leadership for Junior Officers," by Lieutenant John H. Thornton, Jr., Coast Artillery Corps, in the *Coast Artillery Journal* July-August 1943.]

MORE THAN three-quarters of a century ago one of the leading military writers stated that the success of military training is in the acquiring of the herd spirit—unit feeling. Napoleon put his finger on the tender spot, when he said of his soldiers at Waterloo: "They had not eaten soup together long enough."

Ergo, a young lieutenant must find out in a hurry how many different ways he can sit down with his platoon and eat soup together. It is one of the most difficult phases of a young officer's task—the development of unit pride.

Esprit de corps! Once achieved, the dividends always come in at the time they are needed most. That last ounce of strength which is but a phrase on a printed page, until the final minutes of the fourth quarter when it is too late to take time out, is drawn as much from pride as anything else. If the outfit has it, when the heat is on and the chips are down, it will bend and bend, but it won't break.

The young officer must remind his men constantly that they are members of the best battery in the battalion, that they have a reputation to uphold. He must nurture this loyalty to the herd all the time, using every opportunity to remind his men of the bond they have with their battery.

One way to do this is to dramatize the organization; to make every individual remember that he is not only a member of the 999th Battalion, but A Battery of the 999th. In A Battery the grass grows greenest in the front yard, the signs are neatest and brightly painted, the guidon is employed on every occasion. The men have a symbol which relates them to their outfit. Historical, regimental insignia were not developed just to give the jewelers more business.

The alert officer will stage as many parades as possible. He will let the men strut their stuff; get them out of fatigue clothes. He will make his Saturday inspections the toughest and most formal in the battalion. He will turn out in his blouse and best pair of pinks at inspection and he won't forget his old OCS slogan when he inspects his platoon. "Look proud of yourself, mister; you're in A Battery now." He will give them something to think about, something to talk about, and all this will further their pride in the outfit.

The noncommissioned officers are the lieutenant's most valuable training aids in developing unity in the organization. He must deal with them like a manager treats his highest paid opera star; pamper them, cajole them, reason with them, and then drive them for all they are worth. He will allot his noncoms definite responsibilities and remember to make these responsibilities clear and precise so he can accurately determine the manner in which duties are performed. He will nip "buck passing" tendencies in the bud. He will require that his noncoms actually direct the work. He will impress upon them constantly that they are more than high-paid privates. He will confer with them, confide in them, conduct schools for them.

Most young officers realize that they should never correct their noncommissioned officers in front of other enlisted men. They will check their work closely and make corrections promptly, but all corrections will be made in private. Every act will be toward the elevation of the noncoms' prestige in the eyes of their men. And when Corporal Ross turns his squad of mountaineers out with hair cut and shoes shined, then Corporal Ross is entitled to a public recognition of his achievement, which in its own way may have been equivalent to moving a mountain.

A final point on the subject of acquiring the "oneness" so vital to victory in combat. It will come to haunt every young officer in the training of replacements. The only certainty in Army life is uncertainty. The lieutenant must rotate his crews, try out replacements, assign responsibilities to new men, practice operating without key personnel. If he does not, he will wake up at the port of embarkation and discover that his outfit has turned over completely within the brief training period. In fact, the chances are about even that the lieutenant will turn over with it. He cannot forget that the outfit which fires the first burst at an enemy plane will be vastly different from the one which knocked down the sleeve at the service practice.

A weak decision made and executed in good time is better than the finest decision which is too late.

—From an article in the Polish military magazine *Bellona.*

MILITARY NOTES AROUND THE WORLD

GERMANY

Coastal Defense:

A long-range German naval gun being transported on a special carrier for installation on the Atlantic or English Channel coast.

(Berliner Illustrierte Zeitung)

Gewehr '41, the German "Garand":

Among the newer weapons of the German Army is a 7.92-mm (.31) caliber semi-automatic, gas-operated rifle, the Gewehr '41. Three distinct modifications of the rifle are known to exist, the '41, '41-M, and '41-W. The exact status of the three types is not generally known, but it is believed that the '41 and '41-W models are the standard weapons. The M seems to be more of a transitory design.

There is no reason to believe that the new rifle is intended to replace the long-standard, reliable Mauser. The relatively small numbers that have fallen into Allied hands indicate a rather limited use—probably to such special troops as armored infantry or assault units only.

The rifle is quite simple for a semi-automatic weapon and is, in all probability, very inexpensive to manufacture. The overall length is 44¾ inches, which makes it a full one and one-fourth inches longer than the Garand. Although simple in design, the Gewehr '41 is amazingly intricate when one considers the 115 separate parts which go into it. There are only 77 in the Garand! The rifle is quite heavy, weighing 10¼ pounds without sling or bayonet. The magazine, holding ten rounds, is an ordinary stagger-type box.

The gun fires well, and no malfunctions occurred. The gun was not subjected to a prolonged and comprehensive firing course, however, and how it would stand up to rigorous firing under disadvantageous conditions is not known. There was a tendency to heat quickly—the gas cylinder, particularly.

(From an article in *The American Rifleman)*

Prisoners of War:

According to a communication of the Army High Command, the creation of an Inspector General for the prisoner of war establishment has been ordered. The new Inspector General, whose post is equivalent to that of a Commanding General, is directly subordinated to the Chief of the Army High Command. He has to check, in the entire area of the war, the prisoner of war arrangements and the employment of war prisoners with respect to their safe-keeping and their useful employment in the Army within the framework of total employment of all the forces for the conduct of war.

(*12-Uhr Blatt,* Berlin, Germany)

Parachute Troops for Defense:

There is reason to assume that the *Luftwaffe* hopes to combat Allied invasions with offensive tactics. Parachutist units of the *Luftwaffe*, which since the end of 1941 have been used as ordinary infantry in Russia, North Africa, and in the western occupied territories, have been given refresher courses during which they learned how to attack tanks. Dropped behind advancing enemy tank formations, the parachutists had to destroy the vehicles with heavy machine-gun fire or flame throwers which were dropped from the transport airplanes in specially designed containers.

Fallschirmjäger units are expected in future to operate not only in the battle areas, but also far in the rear of the enemy. For such operations each Parachutist Battalion is now equipped with portable apparatus for making bacteriological tests of drinking water.

(*The Aeroplane*, Great Britain)

GREAT BRITAIN

British War Casualties:

It was officially stated on 1 June that casualties to all ranks of British Empire Forces during the first three years of war (excluding deaths from natural causes) were:

	*Killed**	*Missing*	*Wounded*	*Prisoners of War*	*Total*
United Kingdom †	73,477	75,403	50,163	76,801	275,844
Canada	3,142	2,058	1,357	3,865	10,422
Australia	6,192	24,193	15,700	7,874	53,959
New Zealand	3,219	2,860	7,178	6,088	19,345
South Africa	1,439	13,350	3,229	4,597	22,615
India ‡	3,286	86,289	9,168	3,236	101,979
Colonies	1,334	22,566	1,499	5,430	30,829
Total, British Empire	92,089	226,719	88,294	107,891	514,993

* Including died of wounds or injuries.

† Including oversea personnel serving in these forces, in particular from Newfoundland and Southern Rhodesia.

‡ Including casualties to the Hong-Kong and Singapore Royal Artillery.

The figures given above are for the three Services only and do not include the Merchant Navy.

Civilian casualties from 3 September, 1939, to 31 August, 1942, were: Killed, 47,291; injured, 55,643; total, 102,934.

(*Journal of the Royal United Service Institution* August 1943).

"Battle Inoculation" for Tank Crews:

Hundreds of tank crews of the Royal Armored Corps undergo what is known as Battle Inoculation, as a regular part of their training. They are fired on in their tanks by a barrage of two-pounder shells. The shells have no explosive charges and are flat-headed, so that they ricochet or bounce off. During the test, each man in the crew takes his turn acting as captain, and his conduct under fire is carefully noted.

(*Sunday Express*, London, reprinted in *Britain.*)

Expenditure of Ammunition in Battle:

Expenditure of ammunition in modern battles is enormous. Five British field regiments and two medium regiments of artillery firing a battery of 3.7 antiaircraft guns will use one hundred and four rounds in a little more than a minute—and one hundred and four rounds require a three-ton lorry to transport them from the dump to the gun site. During the artillery preliminaries to the attack of the Eighth Army at El Alamein, field guns alone fired a thousand tons of ammunition in an hour. The concentration of this fire is shown by the fact that there was a twenty-five-pounder field gun to every twenty-three yards of the front.

(*Sunday Express*, London, reprinted in *Britain.*)

U. S. S. R.

A Russian Fighter—the LAGG-3:

Some of the obscurity which has hitherto shrouded Russian military aircraft design is dispelled by the translation of a Swedish report on one of the later Russian single-seat fighters, the LAGG-3, lately prepared by the Ministry of Aircraft Production. This report contains some of the most comprehensive information yet issued on a Russian airplane. The airplane from which these details were taken is reported to have been captured by the Finns who presumably granted facilities to Swedish technicians for detailed examination.

In general appearance the LAGG-3 may be compared to the Spitfire, but its airframe is by contrast constructed from plastic bonded wood. A 20-mm cannon firing through a hollow airscrew shaft is fitted in the LAGG-3. One of the most interesting features is the utilization of waste exhaust gases to provide an inert gas which is led into the fuel tanks in place of air as a measure of fire prevention.

The fuselage of the LAGG-3 is built up on birch frames with plywood facing on both sides. The wooden longerons are of continuous triangular cross-section with the base towards the skin. This skin is composed of diagonal strips of plywood. A plastic bonding is used as an adhesive and an attempt was also made on the machine under review to use this material as an impregnating medium. This plastic appeared to hold well even in wide seams, and being red in color caused some bewilderment to the Finns who were unaccustomed to such up-to-date material. They had to use an ordinary body glue for repairs. A German report mentions this plastic bonding as an ordinary phenol-formaldehyde or urea-formaldehyde resin.

Leading Particulars of the LAGG-3

Design Data:

Span—31 ft. 9½ in.
Length—29 ft. 5 in.
Wing area—188 sq. ft.
Aspect ratio—5.55.
Weight (empty)—5,770 lbs.
Weight (loaded)—7,000 lbs.
Wing loading—37.2 lb. per sq. ft.
Power loading—6.37 lb. per h.p.
Span loading—7 lb. per sq. ft.

Performance Data:

Max. speed—348 m.p.h. at 16,500 ft.
Landing speed—87 m.p.h.
Climb—10,000 ft. in 5 mins.
Service ceiling—30,000 ft.
Endurance—2½ hrs.
Range—400 miles.

Motor Data:

Type—M-105P ("pushka"-cannon) 12 cyl. 60 deg. Vee upright.
Max. take-off B.H.P.—1,100 at 2,600 r.p.m.
Rated B.H.P. (13,150 ft.)—1,050 at 2,700 r.p.m.
Cubic capacity—36 litres.
Gauge boost—1,235 at rated height.
Supercharger ratios—7.8:1 and 10:1.

Armament:

One 20-mm. Shpitalny-Vladimirov motor-cannon.
Muzzle velocity—2,630 ft.
Rate of fire—700/800 rounds per min.
Two 12.7-mm (.5 in.) Beresin machine guns mounted over motor with synchronizing gear.
Muzzle velocity—2,760 ft.
Rate of fire—700/800 rounds per min.

(*The Aeroplane*, Great Britain, 13 August 1943.)

Russian Infantry Weapons:

Rifles and Tommy Gun.—The basic rifle, shown first in the group below, is the Mosin-Nagant Model 1891-1930, which fires a 7.62-mm (.30 caliber) bullet. The rifle takes a five-round clip and weighs 9.9 pounds. The bayonet shown is the four-fluted needle

type with screw-driver tip. Modernizations in 1930 were in the front and rear sights. The M1910 carbine and the dragoon and Cossack rifles, both of which are shorter than the 48-inch Mosin-Nagant, have not replaced the basic rifle.

Second in the group is the Simonov or AVS38 semi-automatic 7.62-mm rifle. It weighs 10.8 pounds with magazine and bayonet. Rate of fire is 30 aimed shots per minute. The ten-round magazine protrudes below the stock and is loaded from ordinary five-round clips. The gun carries the short knife-type bayonet and can also be fitted with a telescopic sight.

The tommy gun is model PPSH M1941 and is like the Finnish Soumi. It is a 9-mm gun weighing 10.1 pounds and has a 72-round drum. It is used widely by tank crews.

Antitank Weapons.—The first weapon shown in this group is an early model two-man antitank rifle. It has a very long barrel, a bipod mount, and a muzzle brake. It is a bolt action, single-shot rifle of about .57 caliber.

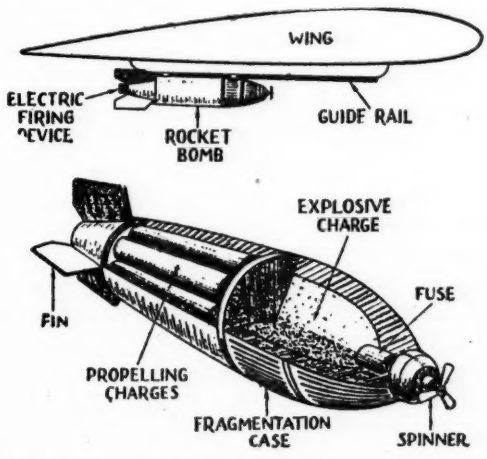
The new antitank rifle, second of the three weapons pictured, has a shorter barrel and is apparently semi-automatic. The bolt of this gun travels under a breech

cover instead of coming out into the open when pulled to the rear. It has a more conventional stock than the earlier antitank rifle and may be gas-operated.

The M1932 45-mm antitank and infantry support gun, shown last, weighs only 1,036 pounds. On pneumatic-tired wheels it looks like the German Rheinmetall 37-mm which fires a 1.5-pound projectile.

(Prepared by Army Orientation Course, Special Services Division, ASF)

The Russian Rocket Bomb:



The Russian rocket bomb has a velocity of 800 feet per second which gives the projectile a penetration of seven inches of armor plate.

(*The Aeroplane*, Great Britain)

Remodeled 15.2-cm Howitzers:

The old 15.2-cm howitzer 09 with a range of 9,000 meters is replaced by the remodeled 15.2-cm howitzer 09/30 which has a one-armed carriage, is arranged for motor towing, and attains a range of 12,000 meters with a projectile weighing 45 kilograms.

The 15.2-cm howitzer 38, pictured here, has a split trail. The 15.2-cm cannon howitzer 37 also has a split trail with a protective shield. The barrel, 4.5 meters long, is provided with a muzzle brake. When the

weapon is motor drawn, the barrel is retracted to a traveling position for better distribution of weight. Two large equilibrators are necessary to decrease the great forward weight of the barrel. A range of 17,000 meters is attained with a 45-kilogram shell. A round may be fired every minute. In traveling position with a two-wheeled saddle limber the howitzer weighs 7,000 kilograms and is pulled by a caterpillar tractor developing a maximum speed of 20 kilometers (12½ miles) per hour.

(Artilleristische Rundschau)

UNITED STATES

Three-year Report on the Growth of the Navy:

Three years ago when the defense program began, the Navy had a fleet of 1,076 vessels displacing 1,875,000 tons. Of this fleet, 383 vessels were warships: battleships, carriers, cruisers, destroyers, submarines. The weight of this fighting fleet was 1,313,000 tons.

During the intervening three years the Navy has lost 58 warships: a battleship, four carriers, nine cruisers, 32 destroyers, 12 submarines. It has transferred to other nations or converted into non-combat vessels 129 other warships. In all, it has lost or given up 484,521 tons of fighting ships—a small navy in itself.

But at the end of three years the United States has the mightiest surface fleet in world history. Against the 1,076 vessels of three years ago the Navy now has 14,072. Their combined tonnage is almost 5,000,000 tons against 1,875,000 tons for the fleet of mid-1940. In the new fleet the Navy, despite its losses, has 613 warships compared with 383 three years ago.

On 1 July 1940 the Navy air arm consisted of 1,744 planes of which 1,197 were fighters and bombers. Since that time the Navy has lost or written off as obsolete 6,800 planes. It has transferred 2,100 planes to other agencies. The Navy air arm of mid-1940 has been erased more than five times over. But the United States now has the most powerful naval air force in the world. Where there were 1,744 naval planes three years ago, on 31 July 1943 there were 18,269, a tenfold net increase.

In the midst of war, the United States has built its Navy into the greatest sea-air power on earth.

(Marine Corps Gazette)

Changes in the Springfield Rifle:

The changes that have been made in the old reliable Springfield rifle are for the most part of minor nature and have little effect on its performance. One of the most important changes from the standpoint of the shooter is the new rear sight. This sight is mounted on the bridge at the rear of the receiver. It consists of a fixed base and yoke, one within the other. The fixed base is mounted rigidly to the receiver. and the yoke, holding the sliding aperture, is operated within the base by the windage screw. The windage screw performs two functions; it holds the windage yoke in place and it moves the yoke to right or left to change the horizontal sight setting. The aperture itself is mounted on inclined ways in the windage yoke so that by pushing it back or forth the elevation may be raised or lowered. While the old leaf sight of the original Springfield was graduated to 2,850 yards, the new one goes no further than 800 yards.

The front sight is now forged in a single piece instead of two as in the past. The case for the oil and thong assembly is made of steel and plastic instead of brass. The trigger guard is stamped out of sheet metal. The magazine floor plate is no longer removable, but is integral with the trigger guard. The magazine follower and spring assembly is now inserted into place from above rather than from below the receiver as heretofore. Various other changes have been made, the net result of which is to lighten materially the weight of the rifle.

The basic Springfield standardized as U.S. rifle, caliber .30 M1903, had a straight grip stock. When this stock was changed to the pistol grip type, it became known as the M1903A1. Now the redesigned job goes back to the straight grip stock and is standardized as the M1903A3. Equipped with a telescope for use by snipers, the rifle is standardized by the Ordnance Department as Rifle, U.S., caliber .30, M1903A4 (Sniper).

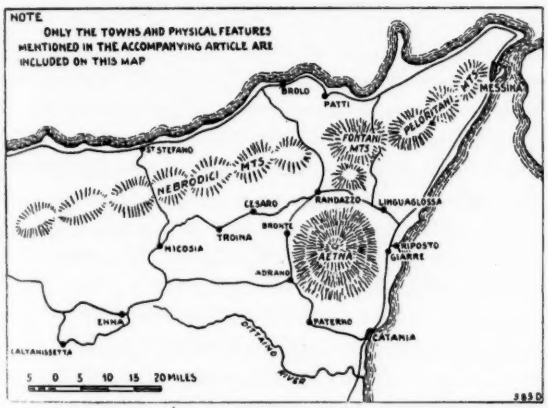
(From an article in *The American Rifleman*)

FOREIGN MILITARY DIGESTS

The Sicilian Campaign— An Axis Viewpoint

[Translated at the Command and General Staff School, Fort Leavenworth, Kansas, from a German article by "a military co-worker," Colonel B. Bossányi, Hungarian Army, Retired, in *Pester Lloyd (Morgenblatt)*, Budapest, Hungary, 19 August 1943.]

AFTER violent rearguard action in the vicinity of Messina, the last German-Italian soldier left the Sicilian area on the morning of 17 August. The battle which has been raging for six weeks for possession of the island is therefore at an end. The situation and combat objectives which developed could be suspected for days before from the statements of German communiqués in which we read: "We may count on further delaying action, in this outermost theater of operations of the southern European front, by means of which the German command is obviously gaining valuable time for making greater strategic dispositions for the military security of its southern front." Also, we read that the steady retreat of the defense "is in harmony with the particular situation in which contending with the Allies for the possession of those sections of the island that have been conquered by them has no part. Rather it is a matter of keeping the enemy from extending his invasion operations to the mainland. This is the task of the bridgehead that has been established by the German command in the northeast tip of the island, and the strength rather than the extension of this position is of importance in this connection."



Everyone must recognize the fact that during the last two weeks the German-Italian defense against enormously superior forces was unexpectedly tenacious and successful.

After the enemy's landing, it was a question of which side would be able to attain superior strength more rapidly. The Anglo-Saxons had been decidedly superior on the sea and in the air since the Tunisian campaign. Hence, even though their supply routes were by water, they had more and better routes than the defenders, who were limited to the single and exposed line across the Strait of Messina.

In the beginning, the main effort of the Anglo-Saxons was directed toward establishing as many bridgeheads as possible, with landing fields and large areas of maneuver for their motorized forces. The success of the strategic breakthrough of the Caltanissetta-Enna line brought the southern and western two-thirds of the island into their hands with a dense and valuable network of highways and railroads.

The German-Italian command drew the correct conclusions at the correct time from the situation that had arisen. There was no sense in entering into a decisive battle for possession of the island. The factors of power, time, and space were no longer at their disposal to a sufficient extent. They chose, therefore, to employ delaying action, and this was pursued by stages to the northeast tip of the island. As with every bridgehead, this one had the disadvantage of having but a few routes of retreat, and finally only one; and even this route, on account of the rapid narrowing of the area to the rear, was increasingly jeopardized and at last ended at the coast in a narrow pass.

This natural route of retreat was the great automobile highway through Nicosia and Randazzo in the broad valley that ran northeast between the Nebrodici Mountains and the Aetna group. One disadvantage of this line was that at Randazzo it is bent toward the coast by the Fontani mountains and afterwards by the Peloritani range. Hence, on the other side of Randazzo the contact of the defense with the Strait of Messina was possible only by way of the coastal roads. For our forces fighting in the center, retreat via these coastal roads was possible only so long as the terminal points of the north-south road through Linguaglossa were in possession of the defensive forces fighting on the flanks. The two coastal roads, crowded into the narrow stretch of land between the water and the spurs of the mountains, afforded the superior attacking forces no sufficient space for movement or deployment—but none for the

defender either. Meanwhile, the superiority of the attacker in the air became more and more evident as the defense area became narrower. In addition to all this, we were forced to face superior naval forces. Therefore the Anglo-Saxon military command was well advised when it made the decision, which it constantly and very logically continued to follow, to exert the pressure of its operational forces in the direction of Nicosia and Randazzo. It was also correct procedure to bring the operations along the two coasts into harmony with this plan. As long as the defense was in the area of St. Stefano, Nicosia, and the Dittaino River, the main line of retreat (Nicosia—Randazzo—Messina) lay almost at right angles to this front, hence in the most favorable direction. The south flank was still anchored on the Aetna group. The direction of attack which was most advantageous to the attacker, therefore, was that which concentrated the pressure of his superior forces on the center and the north flank, because in this way repulse of the defense front from these two directions swung this front away from its advantageous right angle and bent it back to form an acute angle with the main line of retreat. Further retreat, however, threatened the southern wing of the defense, which was holding its position at Catania, with being cut off by degrees. The trackless area of the Aetna group in its rear would then no longer have been advantageous, but disadvantageous, for the defense.

For this reason, as soon as the attack in the center reached the vicinity of Adrano and was able to get under way from this point by way of Paterno in rear of the position along the Dittaino, it was necessary at this place, even when the 8th British Army was inactive, to move the front back to the foot of Aetna. Then, when the attack in the center was carried on past the Troina pass into the area of Cesaro-Bronte, defense of the entire Aetna group became practically useless, regardless of how strong it may have been.

From the Anglo-Saxon side, therefore, it was evident that the strong point of the attack should be through Nicosia, Troina, and Randazzo and that the left wing of the 7th American Army should join in the operations on the coast in the north and support them with as great a pressure as possible. Likewise it was well that in the south, the right wing of the 8th British Army should temporarily limit itself to keeping the defense busy, thus binding their forces. Generally speaking, this plan was successful, and as a result the Aetna group was abandoned after an unexpectedly short defense, and the left wing of the defense had to be drawn back to the Giarre-Riposto line after the fall of Randazzo.

The still strongly defended Messina line extended from the Brolo-Patti area on the north coast straight to the south, was anchored in the center on the Fontani mountains, followed from this point—since the northern spurs of the Aetna group were still in its possession—a southeasterly direction and was anchored at Riposto on the Ionian sea. But there were nothing but strong rear guard forces on this line any longer, and the evacuation of the bridgehead was begun at a rapid rate. After the abandonment of the Linguaglossa road, there was no use of further resistance or any tactical possibility for it.

It would be illogical to compare the Sicilian bridgehead in any way with the bridgehead on the Kuban. The latter occupies a position out ahead of the right wing of a powerful front; yet in the closest operative connection with its strategic area. Its possession means much to both portions of our forces because the opportunity is afforded for the complete flanking of the main hostile front. Sicily is a position on the edge of the German European defense. It is true, of course, that this position is right in front of the door—yet it has no direct operational (military) effect on the continental area. The forces that fought in Sicily—about 20 to 24 divisions—constitute scarcely four percent of the powerful forces of 600 divisions fighting in the east. The size, and at the same time the importance, of the two areas and combats are indicated by this ratio.

Far be it from us to underestimate the efforts and accomplishments of the Anglo-Saxons. They were fighting with great superiority of strength against weak forces; yet as Clausewitz says: "The best strategy is that which insists on our being strong first of all in a general way, then at the decisive points. Skill in command consists in placing superior forces at the decisive points." Thus, attainment of superiority of forces both in the theater of operations and in battle is the duty of the command and at the same time its greatest service. Hence, the work of the tenacious and bravely resisting German-Italian troops, weakened and worn out from fighting, is not discredited in any way—on the contrary, their sacrifice is only the more heroic and the results of it will certainly manifest themselves.

Air Support of Ground Action

[Translated at the Command and General Staff School, Fort Leavenworth, Kansas, from a Russian article by Colonel A. Vasilyev, Soviet Army, in *Krasnaya Zvezda* 12 August 1943.]

EXPERIENCE shows that air support of ground attack usually consists of two fundamental stages: preparation for the attack, and then support of the attack and of infantry and tank actions in the depth of hostile defense. The duration of each of these periods depends on the situation.

The peculiar nature of air attack consists in the fact that air forces, clearing the way for attacking infantry and tanks and reinforceing the fire of the artillery, must also carry on a stubborn battle against hostile aviation. This part of their combat activity is

extraordinarily complex, demanding maximum efforts. Without crushing hostile aviation it is impossible to provide friendly troops with reliable protection, especially in their main concentrations, from enemy counterblows from the air and to secure freedom of action for friendly bombers and assault planes throughout the whole operation.

When the commander of the unit of combined arms and the air commander organize cooperation and plan the combat work of the air forces used for the air attack, they must think first of the organization of combat for the control of the air above the battlefield. The main weight is borne by pursuit aviation which must clear the air of enemy fighters, destroy hostile bombers, and directly protect the combat echelons of friendly assault planes and bombers from counterattack. It is also well known that control of the air as attained not only by attack upon fighters in air battles. No less important are blows on hostile airdromes, executed for the purpose of destroying enemy planes on the ground.

This means that long before the beginning of the operation the commanders organizing air attack must carefully study the composition of the air forces of the enemy and his main bases in the direction of the attack. Choosing a suitable moment, bombers and assault planes attack these bases. Important results can be obtained in the given case only by executing massed blows on all main enemy airdromes, repeating such blows several times. Only this can substantially break up enemy air power prior to the start of the operation, and thus predetermine the success of our air attack.

Such blows on airdromes must be repeated as often as possible during the operation. They are especially necessary when the enemy begins to move his aviation from other directions in order to stop our attack. At this time it is impossible to disregard the forward airdromes of the enemy, occupied by his fighters. Systematic blows on these airdromes force the enemy to move his fighters into the rear, and thus reduce their activity.

In air battles in the sectors of air attack, the actions of our fighters must be permeated with offensive spirit. Unenterprising and indecisive actions of fighters, carried out only above our own positions, will never give possibilities of holding the control of the air. Air attack demands, first of all, wide attack action of fighters. In the use of fighters, various forms of combat work can be employed, but in all cases the main mass of fighters must be used for driving hostile air forces from the field of battle and for inflicting maximum losses on them. When fighters are limited to action in a definite region or group, and hence can not completely display their offensive possibilities, a smaller part of the fighters is used to accompany assault planes and bombers and to execute other, less important, missions. In executing their main mission the fighters first must destroy the enemy bombers, dispersing the group of these aircraft even before they reach the battlefield, using part of the fighters to drive away the enemy fighters, or in any case tieing them up in air battles. We shall illustrate by an example this distribution of problems of the fighter aircraft.

A certain fighter unit had to drive hostile aviation away from the region of the battle. At the designated time, strong patrols of fighters took the air, echeloning in height. But the enemy threw against our air patrol a screening force of ME-109F's and FB-190's not less strong in its composition and also echeloned in height. Three to five kilometers from the front line and above our position there ensued a fierce air battle, which finally drew hither all the available forces of the fighter unit. This was what the Germans were striving for. Taking advantage of the fact that our fighters were engaged in battle they sent several groups of bombers, which attacked the combat formation of our troops, meeting resistance only from antiaircraft artillery.

At the same time, in the neighboring sector of the front, the commander of the fighter group to whom a similar mission was assigned divided his forces into two parts. One of them conducted holding battles with German fighters, while the other at the same time inflicted blows on hostile bombers, not letting them near the field of battle. As a result of such dispersion of their forces, the Germans could not even begin to act effectively against the combat formations of our troops, and lost in a day's fighting about a hundred planes, most of which were bombers.

The solution of the question of fighter accompaniment for bombers and assault planes depends to a large degree on how firmly our fighter aviation succeeds in keeping in its hands the control of the air in the sector of the attack. If the enemy aviation is crushed, then our bomber and assault planes can act on the battlefield with little immediate cover by fighters, and sometimes even without it.

We have already said that air action is divided into two main periods. First is the air preparation for the attack. The main efforts of this period are to exhaust the enemy by day and night attacks from the air, to crush discovered fire elements of his defense, and to disorganize his command. When the attack of field positions is in prospect, air preparation may be short, measured in hours, which increases the surprise of the attack in the greatest degree. In case the hostile defense is strongly developed, air preparation changes to air bombardment, carried out by a long period of methodical blows on the main enemy defensive installations. In both cases this period must end with a massed blow of the combat aviation on the sector chosen for the main effort, immediately before the attack of ground troops.

Air support of the attack and actions of ground troops in the depth of the defense begins at the mo-

ment of commitment of the infantry and the tanks to the attack. At this time, the bombers and assault planes, having finished the massed blow which concluded the air preparation, must at once shift their fire onto those targets in the depth of hostile defense, whose liquidation secures for our troops the control of the first line of fortifications and opens the way for further movement forward.

Problems of planning air actions in the first period (distribution of forces according to stages and objectives of actions, calculations of time of thrusts, and so on), although they demand extreme accuracy, are solved more simply than those of the second period of the air attack. The reason is that during preparation of the attack the active air units have enough time to study the hostile defense, and the main targets are, to a certain degree, stationary objectives.

Crucial moments in the use of aviation and the guidance of its actions usually begin to arise with the commitment of the infantry and the tanks to the attack, with their penetration into depth of hostile defense, and with the development of the breakthrough. These are the most important stages of the air attack. Success here depends on how accurately air action is correlated in time and place with the combat work of ground troops. There is nothing more dangerous than for confusion to occur at this time and for aviation not to appear above the battlefield at the necessary time, ready to beat off the hostile counterblow from the air or crush new obstacles arising in the paths of the attackers.

Practice shows that the planned development of the air attack in its second period is strongly influenced by the system of command of aviation, which must be continuous, assuring well-timed action of various bomber or assault plane groups against objectives hindering the advance of our infantry and tanks.

When the battle takes place in the depth of hostile defense, and also in further development of the breakthrough, there is inevitably a certain confusion of combat formations of both sides, deep wedging forward of some units, and flanking or encircling maneuvers. Each unit breaking out of the general line of attacking troops requires the most active air support. Naturally, this support can be realized well only by those air units most closely connected with ground troops. In other words, during this period some decentralization in the command of combat aviation is necessary. Its basic part must, as before, remain in the hands of the senior air commander, who directs the actions of air forces on the battlefield. But it is best if some units of bombers and especially of assault planes and fighters are temporarily assigned to the ground units which are breaking forward or operating on the enemy flanks. The representative of the air command located with these ground troops, can in the shortest time assign a combat mission to the attached aviation, and ground troops thus quickly receive real support from the air.

It sometimes happens that well-begun air attack later goes somewhat astray in the development of the operation in depth; there ensue periods of time free of air action. This is explained either by the fact that in their own combat work air units lag behind mobile ground troops, or that the commander does not have enough reserves to throw in when needed.

The greatest effort of air actions must correspond to the general demands of the operation, and it will not always be required the first day of the attack. Experience shows that with development of fighting in depth, the necessity of air support for ground troops does not cease, but increases. Only the maintenance of superiority in the air, the uninterrupted, prompt, and powerful nature of air blows can bring about the effect expected of the air attack.

German Self-Propelled Artillery

[Translated at the Command and General Staff School, Fort Leavenworth, Kansas, from a Russian article by Lieutenant General V. Kotelkin, Soviet Army, in *Krasnaya Zvezda* 8 April 1943].

AS A RESULT of the war in Poland and France, the Germans during the latter part of the summer of 1940 introduced self-propelled guns which they now employ widely as assault artillery. The assault gun is an attack weapon. Its basic mission is to silence the heavy infantry gun and hostile antitank weapons.

The self-propelled 75-mm gun with a semi-automatic breech-block is mounted on a 22-ton tank. The horizontal traverse of the gun is very limited. In front and on the sides the gun crew is protected by armor of 50- and 30-mm (about 2.0- and 1.2-inch) thickness. The top and rear parts of the vehicle are open. The vehicle can travel at a speed of 50 kilometers (31 miles) per hour and its range of travel is 135 kilometers (85 miles). 56 shells are carried. The initial velocity of the shell is 425 meters (about 1400 feet) per second. Shells carried are of the fragmentation, armor piercing, and smoke type.

The gun crew consists of the gun commander, pointer, loader, and driver. When an officer who is directing the action rides with his self-propelled gun the vehicle carries equipment for computing firing data, signal flags, and rocket pistols. The range of the radio equipment carried is 4 kilometers (2½ miles) when the gun is stationary, 2 to 3 kilometers (1¼ to 2 miles) when it is moving. Only a receiving set is carried. Inside the vehicle there is a tube for conversation between the gun commander and the driver.

Two self-propelled guns form the platoon. The battery consists of three platoons plus one battery commander's gun, three armored prime movers for ammunition, and train. The self-propelled gun battalion includes headquarters, headquarters battery,

and three gun batteries. The battalion commander has assigned to him one gun for his personal use. According to regulations, the battalion of self-propelled assault guns is an independent unit and is part of the army reserve. An assault gun battery may be detached from the battalion only to the extent that its available transport and administrative facilities permit.

When attached to infantry and tanks, units of assault artillery are placed under the infantry or tank commander but not lower than regimental commander.

German regulations on the employment of self-propelled artillery place great stress on the cooperation of these guns with field artillery. Every officer of the assault gun battalion must be familiar with the plan of artillery fire, locations of firing positions, and OP's. It is also required that the assault gun battery commander furnish regular information on targets by radio for the benefit of the field artillery engaged in the given sector. The division artillery is called upon to provide fire protection for assault guns when the latter are changing positions.

The regulations state that the assault guns are assigned a limited number of fire missions. It is the mission of assault gun batteries engaged in the support of an infantry attack to silence hostile infantry heavy weapons and, above all, those nests of enemy fire which reveal themselves during the course of the attack. When engaged in the support of tank units, self-propelled artillery assumes part of the missions entrusted to heavy tanks, particularly the silencing of hostile antitank guns.

Assault artillery is not used for antitank missions. For this purpose the Germans have special guns which also are self-propelled. Only when it is obliged to defend itself directly does assault artillery open concentrated fire at short range, using armor piercing shells against medium tanks. Its shells are virtually ineffective against heavy tanks.

It is intended that assault guns should open point blank fire suddenly. For this purpose they are brought up under cover to positions of departure. When hostile fire directed against infantry is heavy, the assault gun batteries come to a stop and immediately open fire against those hostile targets which are most troublesome. After firing several rounds the assault guns disappear and reenter the engagement after effecting a change of position.

When engaged, the self-propelled gun batteries are divided into the combat echelon, forward supply point and train. The combat echelon consists of all seven guns and the three armored prime movers with ammunition. Their formation is as follows. The guns proceed in a straight line and in full fire readiness, with the platoon commanders on either flank. The battery commander proceeds in the rear at a distance determined by the nature of combat and the terrain. Behind him the prime movers with ammunition move from one covered position to the next. When the terrain is open, the prime movers proceed at a considerable distance in the rear and communication with them is maintained by radio.

The special mission of the assault gun battery is to facilitate a breakthrough into the rear of the hostile position for the infantry. Here the action may have two variants: before the start of the attack executed in the direction of the main effort, the battery deploys on the order of the regimental commander under whom it is placed; or it is committed after the attack has begun and when the hostile defensive system has revealed itself. In all instances close cooperation of the battery with the battalion or company is mandatory.

When tanks are attacking within the infantry division, the assault artillery battalion first silences the hostile antitank defense and is still attached to the infantry. During this period it remains attached to infantry and is subject to its orders. The batteries, whenever possible, are disposed in positions of readiness before the start of the tank attack and conduct observation during the course of the attack. If enemy tanks counterattack, they are engaged by antitank guns while the assault gun battalion proceeds to silence enemy artillery engaged in the support of the counterattacking tanks. When there is a shortage of antitank guns, assault guns are called upon for additional support against hostile tanks. They open fire on hostile tanks with armor piercing shells at distances of 600 yards and less. During pursuit, assault guns are brought up close to friendly infantry in order to intensify the latter's fire.

When a tank division attacks, the following missions are assigned to the assault gun battalion: support and accompaniment of tanks engaged in a breakthrough (action against enemy artillery); accompaniment of the infantry attack acting jointly with tanks. In supporting tanks engaged in breakthrough action the assault gun batteries are disposed in positions of readiness if it is intended to drive a wedge into the hostile defense. In other instances these batteries move into the attack behind the first wave of tanks; and as soon as the latter meet with opposition, the assault guns provide the tanks with fire support. It is considered that it is not possible to overcome hostile antitank defense speedily without very close contact with the first tank echelon.

In the defense the basic mission of assault gun batteries is the support of counterattacks. In exceptional cases they are used with divisional artillery primarily as roving platoons and batteries. Assault gun batteries are employed for the support of counterattacks regardless of whether they have other missions assigned to them. Having taken up a position of departure for the counterattack, the assault gun battery is then committed in accordance with the same principle as governs its employment for the support of an infantry attack. Reconnaissance pre-

paratory to the counterattack is accomplished as early as possible and jointly with infantry commanders.

The most vulnerable parts of the self-propelled gun are running gear, fuel tanks in the rear of the vehicle, observation instruments, and aiming apparatus. All of our artillery, from the 45-mm gun upwards, and our antitank rifles, can successfully engage the German assault gun batteries. This is a very important task. Experience has shown that the loss of self-propelled guns to a great degree weakens the power of German units both in offense and defense.

Independent Decision

[Translated at the Command and General Staff School, Fort Leavenworth, Kansas, from a German article by First Lieutenant Gutjahr in *Die Panzertruppe* May 1943.]

BEFORE me lies a newspaper of 2 June 1942 in which appears the following report by the Supreme Army Command: "In closing the encirclement around the three Soviet armies a violent battle broke out for a small city and its bridge. The infantry in their assault had scarcely reached their first attack objective when the tanks with infantry riding on them, and motorized formations, drove on through the gaps. The attack was slowed down by a marshy area, but even this presented no serious obstacle. The armored vehicles of an infantry company rushed on. The infantrymen sprang over the sides of the vehicles and advanced behind their commander, who was already close to the bridge. An enemy demolition squad which was supposed to blow up the bridge was driven off by our machine guns and the company rushed on to the other side of the river into the midst of the chaos of stalled and burning Bolshevik vehicles. Light tanks and engineers were quickly on the spot for the purpose of reinforcing the bridge and making it secure for use. Explosions occurring in the city indicated the retreat of the enemy. But a battalion of infantry soon reached the north edge of the city and quantities of weapons, material, and vehicles fell into German hands. An infantry-tank company had pushed its way through the small city and was blocking the two routes of retreat for the enemy. Tank and infantry guns fired into the crowded, retreating columns of the enemy. Those of the enemy who were not destroyed were either forced to turn off into the great encirclement or surrender."

As I read this, I recall that day again.

I see myself with my tank grenadier company standing among the tanks. Among us the shells of the Soviet artillery are striking and after the explosions the black earth rains down in big chunks into our armored car.

Below us lies Barwenkowo beside a little river, and on the far side crowded columns of Russian vehicles are mounting the slopes.

My company commander now points out to me the bridge which we are to capture. The whole of that area is full of Russian vehicles. Why don't our tanks go after them?

"Company, forward march!" I order by radio, and with the signalling disc indicate to the nearby armored car the direction it is to go. While our tanks open fire on the Soviets from the hill we dash at full speed down the slope in the direction of the bridge. Suddenly I see our leading tanks come to a halt. The crews are climbing out. They are stuck in the marsh!

We rush on; nothing can stop us now! Today we must settle a personal account with the Soviets. I had received the news that my brother had been killed before Moscow. They are going to pay for this today!

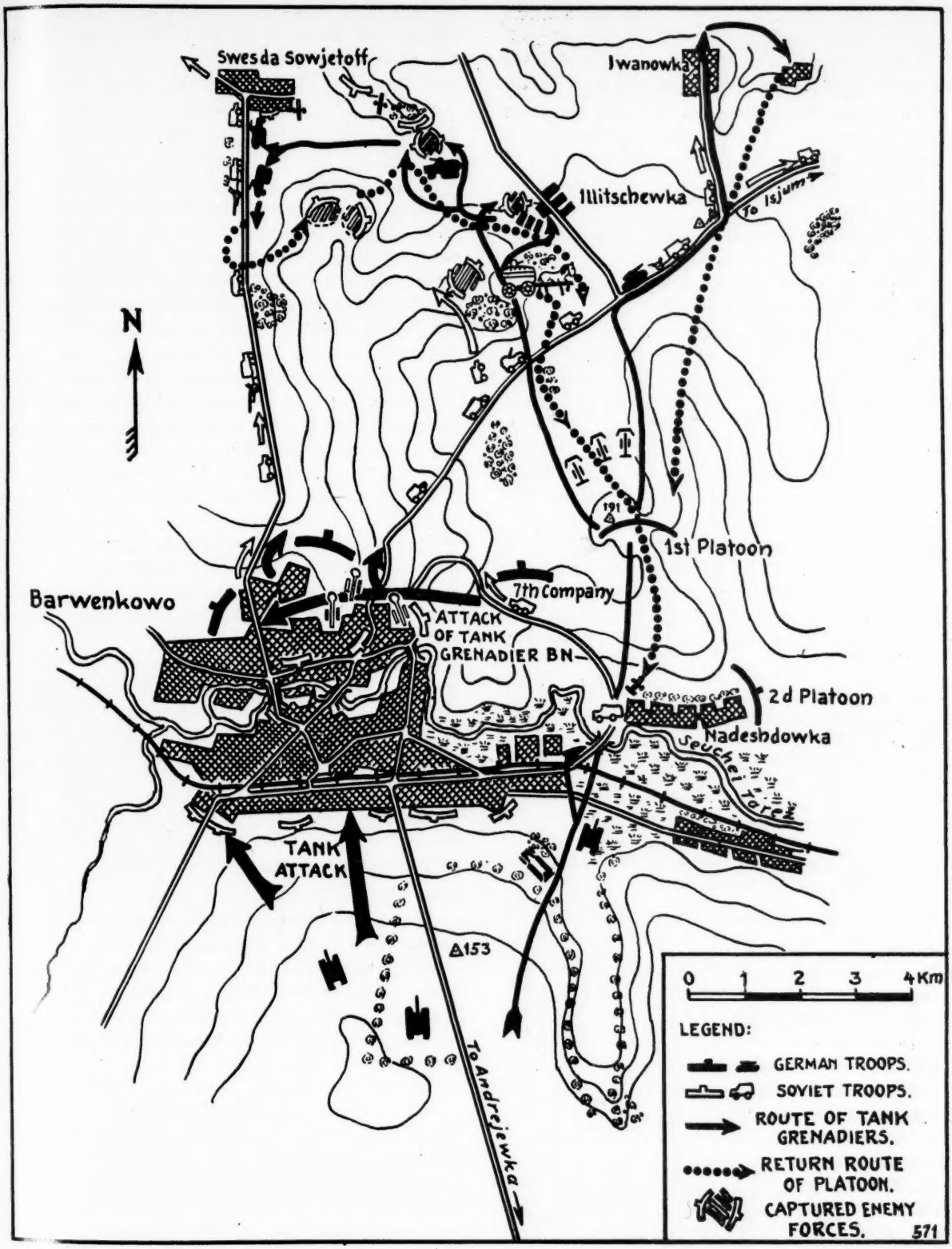
Suddenly my good armored car stops. It too is stuck in the marsh. I immediately grab my machine pistol. "Jump out; follow me," I shout to my men, and in a trice I am over the side of my car. I sink up to my knees in the water and mud. My company headquarters detachment is already beside me. We quickly reach the highway fill and take shelter from bursts of machine-gun fire.

I cast a glance about me. Farther to the left, two of our armored cars have crossed the marsh and are just crossing the highway fill. On my right a lance corporal, all out of breath, is coming up with a machine gun. In front of us is a marshy orchard and a few houses.

The order: "Up, forward march!" is passed from mouth to mouth. In a dash we cross the highway embankment and a few farm properties where the anxious occupants are milling about. "*Wam nitschewo ne grasit!*" (There is absolutely no danger for you!) we shout at them to quiet them, and rush on through marsh and water holes.

Suddenly we see the river ahead of us . . . and there is the bridge! There are still Russians on it. "Bring the machine gun here," I shout to noncommissioned officer T. who is running behind me, and continue on. I see that the Soviets are doing something with fire. The bridge must not be destroyed!

Our machine gun is already hammering behind us. The Soviets are tumbling off the bridge. Noncommissioned officer T. shoots one of them down from a standing position just as he starts to run. The next moment both of us are on the bridge, out of breath. We hurriedly throw into the water what the Soviets had placed there to blow the bridge up, and then continue our dash. Now all we can see is a confusion of trucks, guns, and horse-drawn wagons before us. A few of them have been damaged by gun fire and block the narrow way through the marsh. Others are trying to pass by them on the right and left and are getting caught in the marsh. When the Soviets catch sight



of us, they leave everything in the marsh and try to save their lives.

My machine pistol jams. I shout and yell and wave my arms. Then I stumble over something on the ground and fall full length beside an overturned car. The first of our armored cars is already crossing the bridge. The most advanced of my men are beside me and immediately place a machine gun in position, which is soon sending its bullets after the fleeing Russians.

While we are getting our breath a little, we look over the enormous quantity of captured matériel that

has fallen into our hands—trucks and horse-drawn wagons in great numbers; in addition, antiaircraft and antitank cannon, a small field cannon, and, what is the main thing for the men, something good to eat.

While gunner No. 1 at the machine gun beside us fires belt after belt of ammunition, gunner No. 2 brings up not only ammunition but also a bag full of Russian hard sausages and fills the empty cartridge cases with them.

Now our armored cars are approaching after pushing out of the way a few trucks that were barring the passages for them. Also the battalion commander is there. We are all laughing at our success.

"Up and onto the hill, immediately, with your company! Send out security forces to the north and northeast. I will immediately send the other companies to the left of you!" is the order he now gives us.

We leap into our cars and rush off. Enormous explosions are to be heard in the city, and heavy clouds of smoke and dust go rolling across the valley. We travel past the village of Nadeshdowka and I immediately send the 2d Platoon through the village to its east side. I myself go up the hill with the left platoon. The 3d Platoon is still trailing us. I take a look around. I take note of everything. Our cannon platoon has arrived. Lieutenant Th. reports to me that he is under my orders.

We have arrived at the highest point and come to a halt. What is that we see about two kilometers ahead? It is a large highway and on it are packed columns of Soviets. Lieutenant Th. does not wait for an order. In a trice the guns are unhooked from the limbers, and now the shells are beginning to strike among the enemy.

By radio Lieutenant L. of the 1st Platoon inquires whether he may attack. I reply to him: "Go ahead!"

I try feverishly to make contact with the battalion. No one answers. Then, one and a half kilometers to our left, I see the 7th Company coming toward the hill. I immediately make contact with it and send them the message by radio: "I am going to push on ahead to the highway. Please inform the battalion." Then I can no longer restrain my hunting fever!

We dash forward, my 2d Headquarters Detachment car behind me. The enemy had spread out under the fire of our column and is fleeing in wild droves, trucks, horse-drawn wagons, cavalry, and foot troops, toward the north. The bullets of our machine guns are spattering among them. Suddenly a Soviet Russian armored scout car comes tearing up from the left. The bullets from our machine gun soon put an end to it. The commander of my headquarters detachment fires without a stop. We see the bullets bouncing off the walls of the armored vehicle. But suddenly the vehicle comes to a halt. One man climbs out and runs away.

The highway has been swept clear. We have arrived by this time. The armored scout car is almost undamaged. Some of our shots had passed through the walls of the armor plating; some of the bullets are sticking in it. The wounded driver surrenders, waving a white handkerchief. Other vehicles are standing close by, also two busses. All that are left, however, are almost undamaged.

To our right, the 1st Platoon is engaged in violent fighting in a village in the midst of the enemy. There is nothing to be feared from that side, therefore. On after the enemy! A wild intoxication has taken possession of us. After we quickly paint our insignia and a cross on the armored vehicle, away we go after the fleeing enemy. We are not going to give them any rest.

Suddenly we see in the valley ahead of us a whole wagon column. The drivers apply their whips wildly to their horses. In a trice we are alongside and to the right and left of them. The Soviets throw their weapons away and raise their hands. We tell them in Russian that nothing will happen to them, indicate to them their new direction of travel, and send them to the rear. Two men accompany the column. Just then another of our armored cars arrives. Together we dash on toward several isolated groups of buildings. The shells from our cannon are already landing among them.

In a moment we are there. It turns out that the buildings are temporary barracks. The whole personnel surrenders. A store of weapons and ammunition with 300 new rifles falls into our hands. A little firing range has been laid out nearby. We find old German steel helmets set up there as targets.

One group remains with the prisoners—they number 200 by now. We dash on ahead. We are no longer able to maintain contact by radio. Neither can we see anything more of the 1st Platoon.

At the same time we see again before us on the hill a retreat route filled with great numbers of Soviets, even tractors towing cannon, and more busses. This time we have no gun platoon, and so away we go after them at top speed. The Soviets are taken completely by surprise. They try to escape across the steppe, but the machine guns teach them better. Although we are only two armored cars we succeed in stopping twelve trucks, tractors, and two cannon, and in making them turn around. There is a great horde of Soviets located in a depression. There are about 300 of them pressed close to the ground as we approach all unsuspectingly. Machine-gun bullets go humming over our heads. The prisoners that we have driven together, drop to the ground. My orderly, who has dismounted to put out of commission a cannon which we are no longer able to take along with us, collapses, severely wounded.

Then our machine guns spit their bullets into the mass of men. Immediately the enemy's fire ceases. Wounded men roll on the ground. We yell to them in

Russian: "Surrender. Throw down your weapons. Come here!" They come running toward us and throw themselves on the ground in front of us, for just now machine-gun bullets start whistling over our heads from behind. While the other armored car holds the mass of men in check, we turn around and fire with our antitank cannon at the place from which the fire is coming. In the meanwhile, my severely wounded orderly is loaded into the other car.

We notice two commissars in the crowd to whom I shout in Russian to order their men to form in order and march ahead of us. They yell something at their men, whereupon the latter get upon their feet. We drive them together in a herd.

But now we must get away from here as fast as possible. Still firing into the brush on every side, we drive the big herd of Soviets along, leaving a large number of dead and wounded behind. We add the vehicle column to our list of captives and drive all of them as fast as possible toward the east. It is getting dark and our ammunition is beginning to run out, so we have to hurry.

Finally we see our first highway ahead of us again. I send the one armored car on ahead with the wounded man while I remain with the long column of prisoners which is now trotting along obediently.

The two busses turn out to be former German cars and still bear the old troop insignia. In one of them sits a Russian band and as the tension produced by the battle begins to ease and the Soviets dully light their pipes and cigarettes, one of the musicians suddenly starts up a fast Russian march and the others begin to join him in song.

When we arrive close to the line of our security, the battle in the city has apparently been decided in our favor, for the noise is over.

We arrive in Nadeshdowka as darkness is coming on. We find the regimental commander and bring him the booty we have captured. They are very glad to see us back safe, as the battalion has already reported us as missing. Our 1st Platoon has returned hours before with a considerable amount of booty.

Our battalion has taken and mopped up the northern part of Barwenkowo. It had driven the enemy right into our arms. We now place securing forces on the hills and eat our first bite of food for the day.

We then move our long column out into the open fields. We have, as the results of our day's work, many trucks, busses, tractors, several cannon, antitank and antiaircraft guns, long lines of horse-drawn wagons, and 500 prisoners.

The night comes on. Round about us on the horizon and in the nearby city the fires are still burning.

Launching an Invasion

[From an article by Commander R. C. Todhunter, R. N., in *Britain*, British Information Services, October 1943.]

THE PROGRESS of mechanization and the increase in the number of technical devices used by a modern Army mean that for every hundred thousand soldiers put into the fighting line, approximately thirty thousand tons of stores and equipment have to be provided per week to keep them a fighting unit.

Now that the invasion of Europe has started, the Nazis will no doubt do their best to destroy available ports. If they succeed, the bulk of equipment will have to be landed by means of special craft able to beach in shallow water and disembark men, vehicles, tanks, guns, and stores directly across the beaches.

The number of landing craft required to land and support even one brigade is very large and the number for a great invasion presents a fearful problem to manufacturing resources.

Now for some of the difficulties that arise in the design of landing craft. Take the small craft first. They must be of sufficient size to carry a reasonable number of fully armed men and capable of considerable speed. Their size, and the necessity for armoring them and providing them with powerful engines, mean that they are far heavier than any ship's boat, but they must not draw more than three feet of water or the soldiers cannot get ashore.

The only way to reduce the draught is to increase the beam, but as the beam is increased the weight goes up again and it becomes more difficult to drive the craft through the water at the required speed. As they have to be hoisted in ships, there is a limit to the permissible size and weight, and even now special davits have to be designed and fitted in the ships selected to carry landing craft. In many cases the ships themselves have to be strengthened to take these davits, and fitted with additional generator capacity to provide the electric power to work them.

Any combined operation has little chance of success unless the landing craft can find the exact stretch of beach they are aiming for. In order to do this they must be fitted with an accurate compass. As a compass needle is affected by any magnetic material in close proximity to it, nothing magnetic—that is to say, nothing that is made of steel—is allowed within six feet of it in a normal ship or boat. But you cannot place the compass six feet from the steel hull of a landing craft; and so all the steel in the vicinity has to be specially treated to make it nonmagnetic.

The design of an ideal landing craft depends to a great extent on such factors as the slope of beach on which it is to work, the opposition expected, the state of the sea, and the climate.

If you have a Tank Landing Craft, say two hundred feet long, drawing three feet forward and seven feet aft, the keel slopes four feet in two hundred feet, i.e., one in fifty. On any beach that is one in fifty or *steeper*, the craft will ground bows first in three feet of water; but if the beach is very flat, say one in two hundred, she will ground aft, and there will still be

five feet of water at the bow, which may be too much for tanks or vehicles to wade.

If you are operating in the Pacific islands instead of the Channel, you can do with more speed and less armor. In Arctic conditions you need to strengthen the hulls and prepare the engines to withstand ice and cold.

It is clear that you cannot keep an amphibious force "mounted" with the idea that it can be thrown into the battle in any part of the world. Actually the reverse is the case. Every time the scene of operations changes it means modifications to the ships and craft to enable them to meet the new condition.

As these craft are still comparatively new, every soldier or sailor using them for the first time feels that he could suggest a number of ways in which they could be improved. If he is planning an assault against heavily defended beaches, he wants more armor. If he expects concentrated air attack, he wants more guns. To cover a long distance without detection, he wants more speed.

He does not always appreciate the fact that every increase in weight increases the draught. Even when this objection does not arise, there is the constant demand for more and more landing craft, and the consequent vital necessity not to interrupt the flow of production by introducing modifications. So the final article has to be to some extent a compromise, as it is impossible to squeeze in all the speed, armor, guns, and comforts that one would like to see in landing craft.

The living conditions in the early types were atrocious, and although the later craft have been much improved, the crews still live "hard."

Heavy Artillery in Battle for Centers of Resistance

[Translated at the Command and General Staff School, Fort Leavenworth, Kansas, from a Russian article by Colonel I. Pastukh, Soviet Army, in *Krasnaya Zvezda* 13 August 1943.]

OFFENSIVE actions of our troops in the Orel sector were characterized almost everywhere by strenuous battles for German strongpoints and centers of resistance which the enemy had had a long time to construct. It was not by chance, therefore, that in the course of the battles the role of artillery, and in particular that of heavy guns, stands out especially brightly. How important artillery has become is evident in the example of the battle for a powerful center of resistance built by the enemy at a certain railway station.

The German defense line in this area ran through a series of inhabited places and hills. The railway station, located on an elevation, was the key position. German engineer installations in this position were very thorough. There were seven very solid artillery and machine-gun emplacements alone, each having from five to seven layers of beams. Above the beams were piled rough stone and steel rails from one to one-and-a-half meters thick. The disposition of emplacements permitted the enemy to conduct group fire and secured mutual flanking. The most probable frontal and flank approaches to the center of resistance were covered by massed gun and machine-gun fire from these emplacements.

After careful study of all data about the enemy, it became clear that attacking troops had before them a defensive position of no ordinary strength, with emplacements which were able to withstand direct hits of medium and even heavy shells. To break up this defense it was first of all necessary to destroy the emplacements themselves. As this task was beyond the capacity of light artillery [no mention is made of medium artillery.—Ed.], the command decided to employ artillery of great power.

The commander of the heavy artillery battalion, Senior Lieutenant Davydov, together with the commanders of the batteries and reconnaissance parties arrived the day before the attack at the observation post of the artillery commander of the force of the combined arms. Here, directly on the terrain, targets were designated until darkness fell. Artillerymen chose observation posts, and firing positions to which they then brought up the necessary amount of ammunition. In a word, everything was done so that firing could begin at dawn.

Early in the morning the artillery battalion opened fire. First of all, it was decided to destroy three emplacements. The battery of Senior Lieutenant Maksimov destroyed the machine-gun and gun emplacement adjoining the station building. The battery of Senior Lieutenant Denisov fired on the machine-gun emplacement on the railway embankment. The battery of Senior Lieutenant Bagnyuk conducted fire on the artillery and machine-gun emplacement which covered a gully leading to the station.

In the evening the same artillery battalion renewed demolition fire on three emplacements, two of which were disposed to the left of the railway and one to the right. The rain which soon started, and the fall of darkness, interrupted the firing, as demolition fire is of little effect under conditions of poor visibility. But nonetheless, even this time two direct hits were recorded. During the night, mortars hammered the destroyed emplacements in order to prevent repair work.

At dawn the next day, the intention was to continue the demolition fire for one or two hours, after which the infantry was to attack. But here something unexpected occurred. In the night the Germans, not waiting for the renewal of firing, abandoned the station without fighting. Thus the struggle for the center of resistance ended in favor of our troops, thanks to the fire of the heavy guns.

Now what forced the Germans to cease further re-

sistance? An exhaustive answer to this question was given by an examination of the emplacements and the effect of our heavy artillery on them. Five emplacements were entirely destroyed, while in three of them the personnel and their equipment were completely buried under fragments of beams and stones. The two other emplacements also were disabled. Obviously, the loss of structures constituting the backbone of the center of resistance caused the enemy withdrawal.

It is appropriate to say a few words about the details of the actions of the artillery battalion commanded by Davydov. As is well known, demolition fire requires careful organization. In the given situation, after receiving the combat mission, the commander of the artillery battalion had to choose the most advantageous distance for firing, securing the greatest angle of impact of shell on the target. It was necessary, moreover, to select such a charge as would give the shell the highest terminal velocity. Lastly, it was necessary to select the type of shell and fuze according to the character of the target. The artillerymen solved all these questions irreproachably.

The success of demolition fire was aided also by the correct organization of observation. Senior Lieutenant Davydov moved the observation posts as near to the targets as the terrain permitted. Direct hits on the emplacements with relatively little expenditure of shells resulted from the coordinated observation. Each burst was fixed by intersection from two points, which permitted determination of the locations of bursts with respect to the target both as to direction and as to distance.

In the Orel sector, our artillery had to solve similar problems daily. Experience teaches that blows of heavy artillery on hostile centers of resistance and strong points have a substantial influence on the general success. Without this it is not always possible to silence the system of fire of the German defense, which is based on strongly fortified firing points. It is essential to discover these firing points promptly, determine the degree of their strength, and quickly assign the necessary means for their destruction.

From "Westwall" to "Atlantic Wall"

[Translated for the Command and General Staff School, Fort Leavenworth, Kansas, from an article by Colonel Dr. Rossmann, German Army, in *Völkischer Beobachter*, Berlin, Germany, 24 May 1943.]

EARLIER in the war, an enormous German fortification, the "Westwall," by the mere fact of its existence, exerted great influence on the course of events. The impression of its strength exerted such a deterring influence that the enemy did not dare to attack it, which is the highest kind of praise that can be paid to a fortification. The mere existence of the "Westwall" permitted the High Command to carry out campaigns in the East in such strength that quick overthrow of the Poles was assured. Thereby, the hopes which our enemies cherished for a second front were destroyed.

By May 1940 the time had come to demonstrate its other features. This fortification, the threshold of which no enemy soldier had ever passed, served as a cofferdam behind which the might of the German nation gathered, and, when the appointed time arrived, poured its floods of armed men over the enemy lines. Thus the "Westwall" disclosed its offensive nature as an operations base for the release of irresistible forces.

In the territories which lie hundreds of kilometers west of the old "Westwall," the foundations of a new fortified position were laid by these troops which had burst their former boundaries, and the extension of this new line exceeds in many features the former "Westwall."

The new "Atlantic Wall" is a "war fortress" of a peculiar nature comparable only to the "peacetime fortress" of the "Westwall," and like the latter is a system of fortifications completely equipped in every sense. Defensive positions are generally permanent structures, that is to say, reinforced concrete and armor plate.

In comparison to the "Westwall" two points need to be stressed: (1) From a mere "natural" fortification, a "continental" fortification has grown. (2) Instead of mere "land" fortifications on a large scale, the "Atlantic Wall" is a "coastal" system on a still larger scale, containing all-around defenses which in fact constitute circular systems of defensive fortifications.

The local defensive sector, or coastal defensive sector, includes a mass of large and small positions; a number of defensive "nests" constitutes a strongpoint, and several strongpoints constitute a "center of resistance." Especially important coastal areas, in which, for example, harbors with U-boat bunkers are located, are fortified so that they can defend themselves against sea or land attack, and are so constructed that in the event of an encirclement they can hold out singly until the arrival of the strategic reserves.

The main structures of the defensive positions follow the contours of the coastline which thus defines the main line of resistance. Facing the enemy, the coastline and the sea become the battleground upon which the Navy with its small vessels sets up the outpost line, while the Air Corps serves in this instance as the reconnaissance unit.

Against the artillery attacks of naval vessels with their large caliber guns, there are batteries of medium and heavy coastal defense guns of the Army and Navy, the range of which extends across the Straits of Dover and beyond the English coastline, protecting our own vessels in addition to fighting off

enemy attack. Against small amphibious attack and smaller boats, numerous defensive batteries have been installed.

Scattered around throughout the main defensive areas are the camps of the infantry supporting troops which protect against any sudden assault no matter whether such enemy forces strike from the sea or from the air. These positions are situated for mutual flank protection and support. In addition, wire entanglements and mine fields bar approaches or canalize them, and enemy armored vehicles halted by impassable beach obstacles and concrete walls run the risk of destruction by antitank guns from the front or flank.

Strong overhead covering protects our troops, their weapons, and their ammunition against air attack or artillery fire, and insures uninterrupted observation and fire control during the period of such an attack. As soon as the air or artillery bombardment has ceased and the enemy attack starts, then from firing ports and towers there breaks forth an annihilating fire on the enemy. More armed men rush forth from their assembly positions deep underground and throw themselves into combat with the invading or infiltrating forces in order to drive them back into the sea again. If the enemy should succeed, however, in gaining a foothold anywhere along the coast or should penetrate inland, then the strategical reserves would quickly attack and destroy them.

Like the old "Westwall," the new "Atlantic Wall" will fulfil its purpose whether it is attacked or not. The beginning of a "Second Front" on European soil will either be avoided or it will be hindered.

In addition to its basic defensive mission the "Atlantic Wall" has a still more important purpose which is indicated by its name; this wall is the oceanic bulwark of the German nation, from which warfare on the seas is conducted, constituting the most dangerous attacking position that an insular maritime nation has ever faced.

Tank Fighting in Destruction of Enemy Concentrations

[Translated at the Command and General Staff School, Fort Leavenworth, Kansas, from a Russian article by Colonel P. Arsentyev, Soviet Army, in *Krasnaya Zvezda* 2 July 1943.]

DESTRUCTION of hostile concentrations is the final stage of encirclement. Clearly, it is only possible to attain this by clever leadership of tank, infantry, and artillery units, acting in close tactical contact with aviation.

What are the most expedient methods of surrounding the hostile concentrations? Let us follow the basic principles of this complex operation by the example of activities of a certain tank unit.

The enemy was driven from the defense line and hastily rolled back to the west along several roads. The immediate seizure of all his lines of communications was ordered. A tank unit divided in two groups of unequal strength moved forward by forced march. The larger group of tanks constantly maintained contact with reconnaissance aviation, which periodically reported by agreed signals the location of the head of the column of the main enemy forces. When the hostile column was left behind, the smaller group of tanks and motorized infantry with artillery, under command of Lieutenant Colonel Zhidkov, turned off the highway and quickly straddled the main enemy communication artery running to his rear (Figure 1).

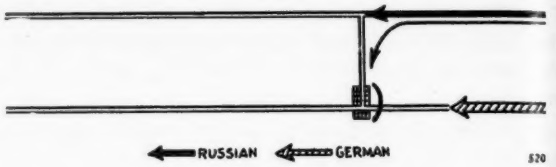


FIGURE 1.

Soon the column of main enemy forces came to within gunshot of the settlement occupied by our tanks, and was met with a powerful fire of tanks and artillery guns. The battle lasted several hours with short pauses. In the afternoon the situation changed in favor of the enemy. Although a solid obstacle was formed on the road by the wrecked German motor vehicles, horse wagons, and guns, the enemy still was able to move to the right around the inhabited place. The position was still more complicated by the fact that other German units came up and began to move around the village to the left (Figure 2).

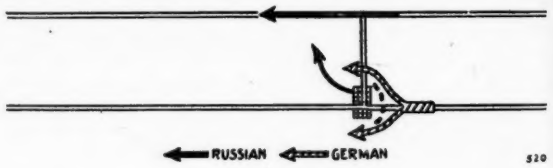


FIGURE 2.

Before our tank group was a dilemma: either to stay in the village, that is, allow itself to be blocked off and doomed to passive action, or move the tanks and motorized infantry out of the village and break up the columns of hostile troops with strong blows at various places. The commander of the group chose the second method of action (Figure 2), leaving for a time some camouflaged medium tanks in the village. When everything appeared blocked by motor vehicles, guns, and supply trains, our medium tanks

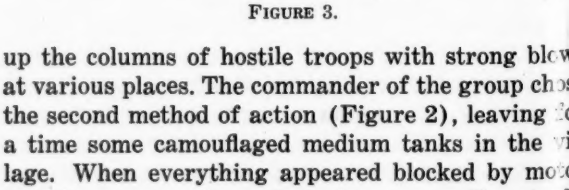


FIGURE 3.

came out of ambush, and firing on the move, began to crush the enemy column with their treads (Figure 3). For a distance of three kilometers a dense mass of broken and burning German machines, guns, and horse wagons resulted.

The German infantry column, retaining as armament mainly light antitank guns, quickly moved forward. Twice it was attacked by the tanks of Lieutenant Colonel Zhidkov. After each blow the quantity of artillery in the composition of the German column grew smaller. Our tanks proceeded on a parallel road, and often in sight of the Germans, constituting a real threat to their flank, which forced the enemy to hasten their movement.

Toward evening, about thirty kilometers from the place of the morning battle, the German column, having lost much matériel and being exhausted, was sud-

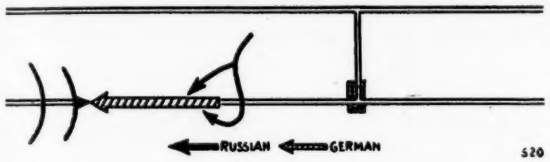


FIGURE 4.

denly attacked by a large group of our tanks (Figure 4). Their thrust was so crushing that the Germans, not even being able to make use of their artillery, were turned to flight. Tanks, following the enemy infantry, annihilated it with concentrated fire of

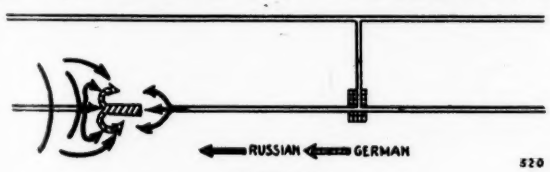


FIGURE 5.

guns and machine guns and crushed it with their treads. Toward evening the Germans had been thrown back on the line of the initial tank cordons. The first phase of the battle of annihilation of a large hostile concentration, that is, encirclement, was successfully concluded (Figure 5).

Conclusions are obvious. To establish encirclement of a hostile concentration, the tank unit must, moving on parallel routes, anticipate the enemy in the seizure of an advantageous defensive position. The parallel movement may flow either along one or both flanks of the enemy at the same time. As soon as the forward tank units get ahead of the enemy column, one group of tanks turns at a right angle, cuts the hostile communications, and takes on itself the main thrust delivered by the retreating enemy avalanche.

What now should be the methods of final destruction of the surrounded hostile concentration? Sometimes the attack originates from several directions toward the center of the encircled German concentration. In this method of action the ring of encirclement contracts more or less uniformly throughout. In the operation analyzed by us the destruction of the surrounded German concentration was realized by way of dissection of the territory which it occupied into a series of isolated sectors. Scarcely

FIGURE 6.

had infantry units moved up and very strong enemy counterattacks on the ring of encirclement been beaten off, when tank and rifle units began their methodical attack. At this moment the territory of the surrounded German grouping had the form of an ellipse 30 kilometers long from north to south and 20 to 25 kilometers wide. Our main forces were concentrated on the west arc of the ellipse. Precisely in this direction the enemy exerted stubborn efforts to break through (Figure 6).

For liquidation of the surrounded concentrations two shock groups were created. When the majority of previously registered German firing positions were crushed by our artillery, the first shock group

FIGURE 7.

attacked. As the enemy had not yet brought up his artificial antitank obstacles, the tanks smashed his combat formations relatively quickly and at the end of the day had moved forward fifteen or sixteen

kilometers (Figure 7). The narrow remaining passage to the opposite side of the ellipse was already easily covered by our artillery. The enemy hurriedly began to inflict return blows on both sides of the inserted wedge, trying to sever it, but all his counterattacks suffered defeat.

With the approach of darkness, a second group of our tanks and infantry struck in the opposite direction somewhat south of the place of the day battle. It broke through a thin screen of German combat formations, and toward morning, having occupied a

FIGURE 8

series of inhabited places, joined with troops blocking the Germans from the west (Figure 8). Thus the territory occupied by the enemy (and hence, likewise the concentration) was cut up into three parts (Figure 9).

FIGURE 9

On the third day of the battle, with joint efforts of tanks, infantry, and artillery, units of the enemy were successfully and completely liquidated in the central twelve-kilometer sector of the territory they occupied. Toward evening the other two groups of Germans were crushed in turn. Thus, at the end of the third day of fighting, as a result of the coordinated efforts of all types of troops, three German and two Hungarian infantry divisions were completely broken.

The experience of these concluding battles also permits the arrival at a number of tactical conclusions. In particular the question comes up: from which sector does the liquidation of the enemy start? The fact is that the surrounded territory never represents a geometrical circle, but most often has a lengthened form lying at an acute or right angle to the line of the front. In that part nearer to the line of the front there is concentrated, as a rule, the greater part of enemy personnel and matériel. Precisely from there the surrounded units make many attempts to break the contracting ring of blockade. In this same shortest direction the enemy inflicts his blows outward. To annihilate enemy units in this sector means to behead his entire concentration. Consequently, it is most useful to clear of enemy troops that sector of the territory occupied by them which is situated nearer the inner ring of encirclement.

As we mentioned earlier, in order to prevent the enemy from breaking out of encirclement, the tank unit must seize all roads, not at one, but at two points, that is, as if at once forming two rings of encirclement. In this the second line must be the more solid, since it will possibly have to withstand simultaneously the blows of the retreating enemy troops and his reserves coming up to the front. At what distance from the first will the second ring of encirclement run? Sometimes, as in the given case, this distance must not exceed 35 to 40 kilometers. If the enemy breaks through the first line of armored cordons, the commander of the second group of tanks will have enough time to organize resolute resistance. Such width of ring also permits rapid reinforcement of any tank force. With greater width such maneuver is made difficult, and the combat command of tank units is made complicated.

A Beachhead in New Guinea

[From *The Times*, London, 25 September 1943.]

SWIFTLY following up the occupation of Lae, Australian forces landed this morning (22 September) in the rear of the Japanese positions at Finschafen. In two respects it was different from the landing on September 4 east of Lae; first, the convoy was attacked on Tuesday evening from the air by a small Japanese raiding force and the enemy had timely warning that something was afoot. Secondly, the landing troops encountered opposition from the moment they set foot on shore. The landing craft and amphibious tactics were the same as used previously, and the same daring plan was followed of landing in the enemy's rear and attacking him from a quarter in which he would be least prepared.

Tuesday evening's bombing attack did no damage, but it gave away the security of the operation. In view of the fact that the large Japanese air base of Cape Gloucester was only fifteen minutes' flying time from Finschafen, every one aboard the convoy expected the Japanese air force to make every effort to disrupt the landing.

In the early hours of the morning the convoys arrived at a point about seven miles north of Finschafen port. The landing was due to be made on a small stretch of sandy beach, the only suitable spot for landing operations anywhere on this coast, which is formed over most of its length of cliffs twenty to thirty feet high. The landing was preceded by an intense bombardment, lasting six minutes, from the United States Navy, which escorted the convoy. From close inshore they pumped many hundreds of shells onto the beach, the fringe of jungle bordering the beach, and the small promontories at either end.

As soon as the bombardment had finished, the first waves of assault troops, whose task it was to remove any opposition from the beach, made for the shore in small assault craft. It was still very dark. They were met even before they began to leap ashore by fire from machine guns and mortars, and by hand-grenades. They suffered some casualties, but overcame the resistance, killed a certain number of the Japanese, and forced the others to withdraw. From other boats of the convoy, which stood some distance offshore, it was possible to watch the flashes from the guns during the naval bombardment and the streams of tracer bullets from the Japanese machine guns firing at the assault boats.

Then followed several waves of landing craft. Finally came several of the largest type of landing-craft. By this time it was already daylight. The sun had risen behind huge masses of towering clouds tinging them with pearl and rose. Many anxious glances were cast on the sky, and one Japanese aircraft did appear, only to be quickly driven off by antiaircraft fire from the Navy. But a formation of our fighters could be seen wheeling about in the sky, and Royal Australian Air Force Boomerangs circled above the land at tree-top level on the look-out for any raiders which might try to sneak in. Soon we had a feeling of complete confidence, which was amply justified during the course of the morning. The Fifth Air Force again did a magnificent job, and during this hazardous landing operation, in a confined space of 600 yards and lasting several hours, not one life was lost due to enemy aerial action.

Ashore the American amphibian engineers were building roads into the jungle. Bulldozers were already at work pushing the undergrowth aside. Long chains of sweating men were carrying boxes of rations and ammunition. The country is very different from that on the coast of Lae. It is very hilly and begins to rise steeply from the shore. The jungle alternates with Kunai grass, and the whole is laced by deep ravines with streams flowing at the bottom.

The first objective, the securing of the beachhead area, was achieved early in the morning. This area comprised, roughly, two miles of coastline and extended more than a mile inland. All through the morning, however, the firing of tommy-guns went on spasmodically, as Japanese snipers posted in the trees and stragglers hiding in thick grass and bushes were dealt with. On the southern flank, patrols began to press forward through a large coconut plantation, and at intervals there was considerable noise from explosions of grenades and mortar bombs and from the rattle of light machine guns.

Japanese resistance here has proved tough. But everything has gone surprisingly well, especially when one considers the speed with which this operation was put into execution. The unexpectedly early fall of Lae decided our Command to hasten forward with the capture of Finschafen. Although this operation had been long conceived and planned, the actual organization of the expedition was rushed through with all speed. Fortunately, efficiency did not suffer. Especially noteworthy has been the contribution of the Fifth Air Force. By their bombing of Japanese air bases and by their continuous patrol of the air they have eliminated the chief danger which might have imperiled the success of the operation.

Night Operations

[Translated at the Command and General Staff School, Fort Leavenworth, Kansas, from a Russian article in *Krasnaya Zvezda* 17 April 1943.]

NIGHT operations are extremely important in the solution of tasks now facing the Soviet Army. All experience of the war bears witness to the fact of our superiority over our enemies in night operations. It is true that the Germans have now begun to engage in night attacks and counterattacks more frequently; but, as a whole, now as before, they stand in fear of our activities at night. This is one of the enemy's many weak spots. It is the duty of our soldiers to take skilful advantage of this weakness on the part of the Germans.

To begin with, there is need of further intensification of raiding and reconnaissance activity at night. Every commander of a force of the combined arms, or a unit, without waiting for orders from above, should make a careful study of the enemy. Day observation is not sufficient for this purpose. It is necessary, in order to seize prisoners for the purpose of checking up on the condition of the enemy, to penetrate the enemy positions at their flanks and junctions with other units. This is more possible by night than by day, especially when there are frequent mists and rains. Small groups are not assigned reconnaissance tasks alone. If, let us say, a

squad of automatic riflemen succeeds in seizing positions on the outer edge of the German defenses, in seizing some advantageous approach on the flanks of their strongpoint, or even part of a town occupied by them, it is necessary to establish themselves here in order to maintain their hold on what they have gained and to exploit their success. And particularly in night operations, there may be assigned missions of demolition of individual enemy firing points, or the destruction of small enemy groups or garrisons.

It is necessary to employ small groups in confusing the maps of the enemy by destroying his mines and other types of obstacles. In a unit of the Guards under Major Lubansky, scouts stealthily approached the German barbed-wire entanglements at night and placed mines in the passages. Since their markers remained in place the Germans did not detect the change that had been made and upon undertaking counterattack they were blown up by the mines. Incidentally, the enemy still continues to make his spring changes of his mine fields and it is necessary in every way to hinder him in this, making wide use of the experience of the Lubensky unit and of many others.

In short, the active and varied work on the part of small groups is of assistance not only in reconnaissance, but also in the systematic attrition of the enemy. This combat work should not occur spontaneously for spontaneity leads at times only to the wearing away of the forces of units without any perceptible results. It is necessary to reconnoiter and to exhaust the enemy with as little expenditure of forces as possible, creating conditions which will permit the units to work ceaselessly in perfecting their positions and at the same time to rest. Night operations are necessary also for this reason, that they enable us to obtain success by means of surprise operations with a minimum expenditure of forces.

Every commander should carefully plan the operations of small groups, especially night operations, with a general purpose, looking forward, among other things, to the preparation of local attacks for the improvement of the positions. It may be advantageous to precede local operations by night operations of small groups. Fighting during the course of several nights in different sectors, disclosing the forces of the enemy, leading him into errors, and wearing him out—these things make for the speedy success of a local attack in a selected place. For such preliminary harassing of the enemy it is necessary to make use of all means at hand and, above all, artillery. The Germans frequently retire portions of their forces from the outer edges of their positions to a nearby town for their night's rest. He who permits the Germans to do this is, at any rate, improvident. It is necessary to find out where these nocturnal journeys of the enemy are occurring, where he is directing his soldiers for rest, and then deny them the opportunity to undress tranquilly and go to sleep. This is accomplished also, among other methods, by means of harassing fire laid down along the trenches of the enemy and over the points in which he stations himself for the night. It is expedient to bomb the enemy methodically at night. One should also take advantage of the nightly transfers made by the enemy for the purpose of providing rest for his front line troops, and attack his defenses in the weakest spot in surprise operations. In one unit only seven of our soldiers, who had seen how the Germans retired to the rear to rest, seized a small village which in the daytime a company had not been able to take.

At present, combats of local importance take place in many sectors. At night they give the best results of all. It is wrong to suppose that in this only small groups must operate. If the situation demands it, it is necessary to engage greater forces in the operation, making use of them in accordance with the basic data in our regulations.

The leading role in a night operation falls to the infantry, but every arm takes a part in it without regard for the limitations in the employment of matériel at night. The difficulties of night operations are compensated for by special care in preparation while it is still light and, above all, by careful organization of cooperation. There is planned the simplest operation possible, but this is accomplished exceptionally methodically, with scrupulous attention to details, and, in addition, with complete observance of secrecy. Having spent, say, three or even only two days in the preparation of such an operation, the commander surely expends fewer forces and less equipment than with fast local attacks in daylight hours. As a general result, he will also spend less time.

Regulations give the basic rules for night operations and warn against the use of stereotyped methods. Making use of our wealth of experience in night operations, the commander should strive for an original solution of the local task, a thing which is extremely important in case of protracted contact with the enemy. It happens, sometimes, that a regiment is operating thus: it effects reconnaissance in force and, after an interval of three days, attacks. If the attack does not succeed, again there follows a reconnaissance in force and, after the same interval of time, there takes place a new attack. In the meanwhile the enemy will have turned his attion to this place and will maintain the necessary forces there. If these attacks are made also at night, the results will be extremely doubtful. Better results will be attained if the commander mobilizes all his knowledge and also the experience of others and finds a solution which surprises the enemy.

During the operation at Dmitryev-Lgovsky with the enemy in possession of nearly three times as great forces as our attacking unit, the Germans pos-

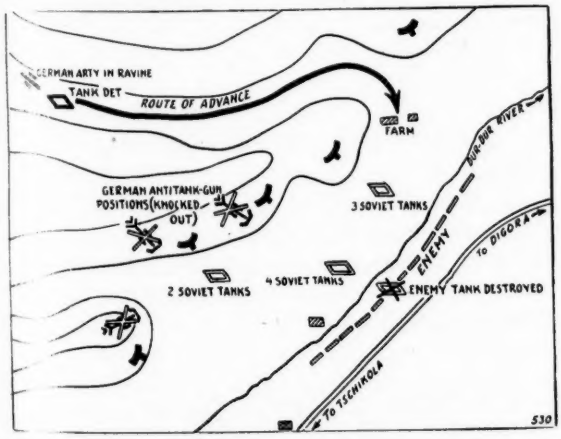
sessed, in addition, a very solid and complicated defense. The commander of the unit decided to attack at night. The attack was preceded by night reconnaissance in force. A detachment engaged in the execution of the reconnaissance found the junction between two of the enemy's units and boldly penetrated to one edge of a town. The enemy camp was alarmed. But when our detachment departed, the Germans quieted down, having understood that that was only a reconnaissance operation and thinking that the attack would not follow soon. In the meanwhile the commander of the unit did not wait a single hour. He attacked the enemy immediately with all his forces, dealing the main blow in the place that had been explored by means of the operation, and before the enemy had succeeded in bringing up reinforcements. The attack was entirely successful. Thus it always happens when well prepared and organized night operations catch the enemy unawares.

Making extensive use of night for the solution of missions of the most immediate nature, our forces should at the same time improve on the methods and forms of night operations. In the forthcoming actions this will help us to attain decisive successes more quickly and with fewest possible casualties.

A Tank Maneuver in the Caucasus

[Translated at the Command and General Staff School, Fort Leavenworth, Kansas, from a German article by 1st Company Leader Schnitzker of the Elite Guard, in *Die Panzertruppe* June 1943.]

DURING the night between 24 and 25 December, in operations which were carried out in the upper Terek sector for reducing extension of the front, the division had disengaged itself from the enemy and occupied a position on the Dur-Dur River. The withdrawal had escaped detection by the enemy. During the morning hours of 25 December the Russians pursued us, coming from the direction of Digora with at least eleven tanks and numerically strong infantry forces.



Around 10:00 o'clock in the forenoon the 2nd Tank Grenadier Regiment of the Elite Guard requested tank support since there was danger that the enemy tanks, which had already crossed the Dur-Dur and were now in the main line of resistance, would break into the position.

The commander of the tank detachment which was standing ready for use as a reserve for a counterattack immediately decided to commit a combat group with the assignment of destroying enemy tanks which had broken through, in order to make possible the continued and unhampered withdrawal of the division in the evening.

The commander of the 2nd Company took over command of the group.

At about 11:00 AM the combat group started on its way and soon reached the battery positions which were located in a deep and wide ravine (see sketch). Operating from this point, the company commander, accompanied by his platoon leaders, undertook to reconnoiter the terrain on foot. When we had reached the sector of the 2nd Battalion, the following picture was presented to us.

The hilly area in which we were located dropped down gently on the east to a great plain, traversed from the southwest to the northeast by the Dur-Dur. The hills were crossed by wide ravines which presented no difficulties to travel and which opened onto the plain. On the far side of the river the terrain was level as far as Digora, which could be seen clearly on the horizon. The banks of the river were steep in places yet the river itself was not tank proof, as the enemy had proved. The river bed was so low that we could not see it even from our hill. From our location we were at first able to make out but two enemy tanks on this side of the river. These stood close in front of our positions and kept up a constant fire, forcing our own infantry to keep under cover. On the far side of the river stood a T-34 [Russian heavy tank] which had already been put out of action by a direct artillery hit. We were able to make out great numbers of infantry along the far side of the river. They were standing around or reclining on the ground and did not give the impression of intending to attack at the moment. For the time being the Bolshevik attack seemed to have come to a halt. Yet on account of the wonderfully favorable position which the enemy tanks had in front of our positions there was always danger of a continuation of the attack. The company commander decided, therefore, to take advantage of the ravine in which our tanks were located, and which afforded complete cover for an advance, to cut around to the left of the enemy and strike his flank.

To this end the order was given that the tanks should move forward in marching formation on account of the danger of mines which were everywhere in the terrain. At the end of the ravine they were to take up a firing position on a broad front, advance,

and make a turn to the right. Then we intended to surprise the enemy by a burst of fire from all our guns. The firing formation was assumed in perfect order. Our sortie from the ravine and our turn to the right did not appear to be noticed at all by the enemy on the other side of the river. Apparently we could hardly be discerned in the tall grass through which we were now moving. Besides, we were able to execute the turn under cover of a large farm which was in the plain to the right of the ravine. The enemy tanks on our right were also wholly unable to see us. Unfortunately, however, the weather was rapidly growing worse. It was getting misty and we could scarcely see 1500 meters ahead of us. Then, too, a light, driving snow was beginning to fall. We took up positions between and to the rear of the farm buildings and suddenly opened fire on the three Mark III tanks which were visible not far away from us. These immediately replied to our fire but were put out of action in a few minutes. The combat distance amounted to from 600 to 800 meters. We now continued to roll ahead until suddenly four other tanks of a much lighter type appeared in the high grass ahead of us. They received us with a murderous fire but directed it as badly as the ones we had just destroyed. During the battle we suddenly saw through the mist, at a distance of about a thousand meters, two other tanks come out of a hollow and attempt to flee at top speed toward the left. While our other tanks continued to fight the old enemy, our one self-propelled gun took charge of the foremost one and a Type IV tank went after the second one. The first shot from the self-propelled gun just missed its mark and before the second round could be fired the tank disappeared in a depression. Our Type IV tank had better luck. At a range of 1000 meters it succeeded in setting fire to the moving hostile tank which, in addition, was very hard to make out. A lucky hit, but a masterly shot. Within a short time, the remaining four tanks on the field of battle were set on fire. With the remainder of the armor-piercing shells, the self-propelled gun finally destroyed the T-34 tank on the other side of the river, and explosive shells were employed against the infantry. Then came the order to return.

On the way back a special surprise was awaiting us. We had gone into marching formation again and were rolling up a smooth slope on the way to our battalion. Suddenly, half way up the slope, we received a murderous fire from the rear from antitank cannon, antitank rifles, machine guns, and one antiaircraft cannon. These weapons were located, as we could now see, in defiladed positions along the depression occupied by the river. Either they had not been able to fire on us during the battle on account of our being in a dead angle or they had preferred to remain unnoticed. Then as we were rolling up the slope on our way out of the fight they had seen their chance. Fortunately, their aim was just as bad as that of the tanks. The antiaircraft cannon and antitank rifles alone were able to make a few hits but these produced no effect.

And so we got back without the loss of any of our vehicles and were able to report the destruction of nine tanks—one T-34 and eight Mark III's. One of our Type III tanks was not able to remain with us during the battle as it was having trouble with its fuel system and had to return at a slow pace. One of the self-propelled guns had a bogie wheel shot away and also a bunker stove which it was carrying.

With this Christmas success of ours, the Bolsheviks lost their desire for any further attacks for the time being. A few hours later the division was able to withdraw unimpeded from the enemy and finally was removed from the Caucasus front to be employed in another place.

Conclusions

1. It would have been impossible to surprise the enemy tanks if a frontal attack had been made by way of the hill. In addition, the enemy's antitank weapons in the depression of the river would have been able to take us under fire from the beginning of the engagement. By the flank attack, the enemy tanks were taken completely by surprise. Since an attack from this direction evidently had not been expected, the enemy antitank weapons were not employed at all during the fight. From the very first our overwhelming superiority precluded any changes in the operational plans of the enemy tanks and antitank defense.

Conclusion.—If there is time for it at all, the terrain should be thoroughly reconnoitered before the beginning of a fight.

2. Furthermore, it would have been wrong to have permitted one or two tanks to make a frontal attack over the hill as a diversion maneuver for the purpose of attracting the enemy fire, and then to attack the enemy's flank unnoticed. In the first place, that would have exposed the attacking tanks to an unnecessary risk; and, in the second place, the fire power of these tanks would have been absent from the combat group which was too small for such a maneuver.

Conclusion.—In order to have a concentration of fire all vehicles should be kept close together and at the decisive moment should suddenly open fire on the enemy with every gun. Do not disperse your combat forces. The principle is that one can never be strong enough.

Field Artillery vs. Hostile Planes

[Translated at the Command and General Staff School, Fort Leavenworth, Kansas, from a Russian article by Major F. Larionov, Soviet Army, in *Krasnaya Zvezda* 4 July 1943.]

OUR FIELD artillery is able to protect successfully its own combat formations from blows of hostile

bombers, firing on the latter with 76-mm field guns of all types and with 122-mm howitzers, model 1938. True, the howitzers are slower than the guns in speed, but they exceed them in fire power.

For firing at air targets high-angle elevations are required. As is well known, field artillery is not designed for high-angle fire. To give the guns the highest vertical angles, we arrange special firing positions. In the ordinary artillery trench, an underdigging with apparatus is constructed for the pegs of the mounts, having bevel slope with consequent deepening from center to edge of trench. The deepening amounts to 40 to 50 centimeters which permits increasing the angle of elevation 10 to 15 degrees. Consequently the limit vertical angle increases from 40 or 45 degrees, to 55 or 60, which gives full possibility for firing at planes.

Depending on the circumstances and combat problems, we designate one or two guns from a battery for the purpose of firing on air targets. But there are also days when, for repulse of massed flights, it is necessary to use all the gun batteries. Of course the guns of these batteries must be suitably prepared. It is necessary to dig holes in time, have ammunition at hand, and check the readiness of the gunners for firing on air targets.

It is well known that hostile planes may appear suddenly and from the most unexpected directions. For this reason orienting points are previously selected at a distance of one to two kilometers, distances are measured, aims are fixed, and a plan of antiaircraft defense is made separately for each gun on the basis of received data. The presence of general orienting points for guns facilitates for the commander the control of fire in repelling air attacks and permits him to concentrate rapidly the whole mass of fire in the threatened directions.

When hostile planes appear it is very important not to delay the moment of opening fire. It is necessary to open fire with a little anticipation, that is, before the planes reach the orienting points. This is done with the intention that the shell bursts should block the way of the hostile planes, disrupt their combat formation, and force them to jettison their bombs before reaching their target. Since the moment of opening fire is exceptionally important, it is essential to have the keenest observation of the air at all times. To increase the speed of fire, shells are prepared beforehand with fuzes set, corresponding to the distance to each orienting point. Shells, laid out in boxes, should be arranged in accordance with the targets for which they are designated.

The order of firing is as follows: Upon appearance in the air of hostile planes the senior at the battery commands: "West (or whatever the direction in which planes appear), height of aim 600, platoon (battery) fire!" The commander of a gun in his turn gives the command: "Orienting point five, height of target 600, fire!" The gunner with the aid of the panorama aims the gun at the target, giving it the assigned angle of elevation by action of the elevating mechanism. The goniometer is always placed at 30-00, the mirror (reflector) at 0-00. Getting the target in the cross of the sight, the gunner fires.

In an experimental way we figured out special tables. Determining the elevation and speed of the plane, the commander can, with the help of the table, quickly find the corresponding setting of aim and fuze, and also the mean time of flight of the shell for this distance. Such a table greatly facilitates the work of the battery officer freeing him from complex calculations in the process of battle. It is clear that for speed of fire, good training of the gunners is important—knowledge of quickly shifting the gun in a circle of horizontal traverse, instantly giving it the angle of elevation, quickly and accurately making corrections, etc. These habits we inculcate in the gunners with the help of frequent school training.

Some commanders evaluate the effectiveness of fire of field artillery on air targets by the number of downed planes. Such a point of view is fundamentally wrong. Field artillery guns do not have special antiaircraft equipment, and thus it is hard to get direct hits on planes. But it does not follow from this that fire of field artillery on hostile planes yields nothing. As proof, facts can be cited. During the fighting at Velikiye Luki the enemy tried to bomb our formations for fifteen days, but suffered failure each time. Our field guns erected such a curtain of fire in the air that the German fliers did not risk breaking through it, and dropped their bombs before reaching the targets. The Germans thus were unable to attain success.

Practice shows that there is sound sense in using field artillery for fighting hostile aircraft. It is only necessary to organize it well. The commander must not rely entirely on antiaircraft elements. He must also take care of the antiaircraft defense of his own combat formation by the use of field artillery weapons and then hostile attack from the air will have less chance of success.

A Scouting Detachment Before Leningrad

[Translated at the Command and General Staff School, Fort Leavenworth, Kansas, from a German article by Josef von Golitschek, war reporter with the Elite Guard, in *Das Schwarze Korps* 5 August 1943.]

IT is midnight before Leningrad. There lies a thin streak of light across the sky in the north, bathing the terrain in the foreground with a pale, ghostly glow. A light ground-fog has risen, its grey winrows rolling sluggishly across the depressions and above the antitank ditch which, at one time dug for the defense of the city, now runs straight as a string on

the left of us toward the Soviet lines. It is ideal weather for the scouting detachment.

Singly and in small groups, the men descend with heavy tread the few steps to the bunker of the platoon leader. There they stand, blinded by the glare of the carbide lamp which paints their enormously distorted shadows on the wooden walls. They are waiting for the platoon leader who has gone out again to check over the terrain. Hardly a word is spoken. There is no longer much to be said. They know why they are being sent out. New troops have come into the Soviet positions yonder. Where are their combat outposts located? In what way have they further improved their trenches? It is a clear and simple mission.

After awhile, the first platoon-leader comes in. Once again he announces the course that has been planned for the scouting detachment, explains possible incidents and assigns the men their various duties. No particular tension can be noted in their faces. They have been over toward the enemy's lines too many times recently on similar missions. But a great deal of change must have occurred, so they should be cautious. The enemy will be sharply on the watch in this sort of weather. Cigarettes are extinguished, the lamp is put out, and fourteen men step out into the night.

The men have to stoop low to pass through the little passage which leads from the trench down to the bank of the stream. Between the German positions and no-man's land lies a branch of the stream which is crossed on a narrow wooden foot bridge. Then the men turn to the left, traveling along the bank toward the antitank ditch. In the distance a flare trembles, but its light does not penetrate to the men who are crawling over the body of a Bolshevist —who knows how long he may have lain here!— and descending into the deep furrow of the ditch. They meet with five or six dead men along the way, forgotten like the wrecked tank in the shelter of which the men leave the ditch after a hundred meters.

They are now sixty meters in front of the Soviet trenches. The security detachment with the heavy machine gun goes into position. If the Bolshevists should rush out and succeed in getting through the brush and reaching the water on the right, the scouting detachment would be cut off. Stormtrooper H. crawls further along the antitank ditch and looks over this dangerous terrain. In the meanwhile the fog has hidden the detachment.

Now they crawl farther, sliding along on the muddy soil. Cautiously they feel their way with their hands. Not a twig must crack and betray the operation. The heavy ammunition cases press down on them. Meter by meter they advance. Again they split up and fan out to the right and left with a light machine gun on each flank. Now every man is on his own. No one is able to see his neighbor any longer but knows that he can depend absolutely on him. Nothing can yet be seen of the Soviet trenches. They advance a hand's breadth and then another.

There is the sound of motors in the sky. Twice the earth is suddenly shaken by heavy aerial bombs. They are a long ways from it but the men make use of the resulting noise.

And now the trench they are seeking comes into view. It is driven farther into the forefield than they had thought. With a leap, two of the men have crossed it. They cannot continue their advance in the ditch itself as they had wished. It is filled to the brim with water. But in this way they are able to get at the outpost from the rear.

Stormtroopers B. and J. set up their light machine gun. Now they are ready. Suddenly a form rises in the ditch immediately in front of the detachment leader—"Who goes there!" The machine pistol of the section leader speaks. The Bolshevist disappears behind his cover. Was he hit? Somewhere a shrill voice calls out "Alarm!" B. wishes to take a hand with his machine gun and notices that he is directly in front of a Soviet machine-gun emplacement. He leaps to his feet, seizes his machine gun and throws himself down ten meters further to the right. A hand grenade explodes directly in front of him. He pulls his head in and draws his body together. Fragments whistle through the air about him. Something strikes him in the face. Is he wounded? No! No, it's only a piece of mud. He wipes it out of his eyes, but his machine gun will not shoot any longer. J. throws two hand grenades into the Soviet machine-gun emplacement, putting it out of action. The cry of alarm is heard again. Hand grenades come flying through the air. They cannot be seen; all you can hear is a low click in the trench and then the explosion. The two men who had leaped over the ditch fire their machine pistols as fast as they are able. Soon the mazagines are empty and they are forced to go back. They leap across the ditch. One of them slips on the clods of freshly evacuated earth but recovers his balance. A burst of machine-gun bullets comes flying from the left, but he is already under cover of the parapet. The Bolshevists rush in from both sides toward the place of the breakthrough. One can hear them wading in the water, can see their crouching figures and the rounded form of their steel helmets momentarily over the edge of the trench. In front, behind, and among the men, explode the Soviet hand grenades. "Go back!" commands the section leader, for the purpose of the thrust has been attained. Blind with rage, the Soviets fire into the night. Tracer bullets fly over the forefield like hail in a storm. The men work their way back in a succession of dashes.

On the right, the Soviets are advancing. They break their way past our men on the other side of the antitank ditch with the intention of blocking it farther back where our men must pass. H. leaps to

his feet. A burst of machine-gun fire goes hissing above his head—bright tracer bullets. He leaps into the antitank ditch and runs as hard as he can go, for his own life and those of his comrades. Suddenly, half way to his goal, he catches sight of little black boxes ahead of him. The floor of the ditch is quite narrow. He is no longer able to alter his course. With a leap, he lands right between them, leaping to the right and left he makes his way through them. Up the side of the ditch he goes. There is the security detachment. "Attention! Soviets from the right, fire!" cries the first platoon leader. The cartridge belt flies through the machine gun. The hand grenades land closer and closer. Are the Bolshevists following them? The scouting detachment returns. All the men are there. Are there any wounded? No! Now they fire as fast as the guns can discharge into the bushes on the right. Others squat in the antitank ditch and shoot down along it in order that the enemy may not be able, somewhere there in the dark, to set up a machine gun.

"Draw back slowly," commands the first platoon leader. The men descend one after the other into the antitank ditch. The first platoon leader looks around him. Just a minute ago, J. was still kneeling. Now he is lying beside him. "All in, J.? Come on, let's go!" "He is wounded," says some one from the other side. They lift him up. Blood is running down his face. Stormtrooper S. loads him onto his back. He carries him all alone. The heavy machine-gun crew passes him. The other men are already a little ways ahead of him. "I can't go any further," groans S. I can't make it alone!" He lets the wounded man slide to the ground and squats down beside him. A stream of machine-gun bullets passes closely above his head. Instantly several of his comrades run back into the enemy fire, pick J. up and run with him to the antitank ditch. S. supports the head of the unconscious man and listens to his breathing. It is getting fainter and fainter. "One man on ahead; get the stretcher bearers!"

H. starts away on a run. Did the Bolshevists manage to get through? Will they be waiting down there at the end of the antitank ditch or not? He knows only his mission and hurries on with long strides. There lies the dead Bolshevist. He has come to the end of the ditch. "On now! They will shoot now if they are here!"

Very slowly the four move along with the wounded man. One machine gun remains behind and replies to the fire of the Bolshevists. Then, after the last men have passed, it too withdraws. The footbridge between the steep walls of the antitank ditch is narrow and slippery. Time and again, the men slip and are forced to seize hold of the soft clay wall to keep from going down. They are breathing hard from their exertion, but they are trying to save their comrade any unnecessary pain. Carefully, they step across the dead Bolshevists. The wounded man begins to breathe noisily—then is suddenly still.

"He has stopped breathing," says S. after a while.

At the exit of the antitank ditch stands one of the men who had gone on before. With a machine pistol ready for action, he covers the return of the others. The Bolshevists had not gotten through. The way is clear.

When they reach the foot-bridge, H. approaches them with a stretcher. Slowly, the men bear their dead comrade back across the branch of the stream, on the surface of whose waters the first rays of the rising sun are reflected.

Point-Blank Fire

[Translated at the Command and General Staff School, Fort Leavenworth, Kansas, from a Russian article in *Krasnaya Zvezda* 18 April 1943.]

COMBAT experience of the Soviet Army's artillery is replete with instructive examples of superior employment of point-blank fire. This method of using artillery is effective in the most varied forms of combat. By skilfully combining fire from concealed positions with point-blank fire, artillery executes its missions more speedily and with greater effect. These missions involve preparation for and support of our attacks, repelling enemy attacks and counterattacks, and development of battle after it reaches the enemy rear. As a rule, risks and losses which are unavoidably involved with bringing guns close to enemy positions justify themselves and are compensated for by the sureness of the blow inflicted on the enemy and the great German losses suffered thereby.

Boldness, bravery, firmness—these are the necessary qualities of the masters of point-blank fire. They not only bring about improvement of an unfavorable situation or successful defense of positions against massed enemy blows, but they also provide opportunity for taking the initiative into our own hands.

In one sector of the fighting front the Germans started an attack with 3,000 infantrymen and 500 cavalrymen, accompanied by 14 tanks. Artillery units commanded by Majors Frolov and Ordynsky were immediately engaged against the enemy. All their guns speedily deployed in the open and opened the most intensive fire. The enemy stopped, and his combat formations became disorganized. Denying the Germans even a moment's rest, our artillery increased the tempo of its fire. When all ammunition was exhausted our forces counterattacked. As a result the entire German concentration was crushed and its remnants were thrown back several kilometers. About 2,000 enemy dead and 10 tanks were left on the battlefield, and 150 prisoners were captured. The battery of Senior Lieutenant Merkulov

alone killed about 600 Germans and disabled five enemy tanks.

Similar examples are numerous. Both in offensive and defensive actions, as well as in battles of position or maneuver, great losses have been inflicted on the enemy many times by our artillery firing over open sights. In this manner aid was rendered to the main mass of artillery firing from concealed position.

However, success does not occur of itself. Point-blank fire, especially when used in mass by a large number of guns and howitzers, is a complicated and responsible matter requiring a high degree of mastery. For the commander who is organizing this fire, profound knowledge of the situation and sober calculation of fire possibilities and the tactical and technical capabilities of the guns employed is mandatory. These important factors are frequently overlooked and the whole thing is approached on the oversimplified principle: "Let's shoot!" As a result, there were instances when assaults on log-and-earth fortifications of great constructional strength were assigned to small-caliber guns. Cases also are known when point-blank fire was used without any consideration of the situation, and at times when it was wholly unnecessary. Things such as these deserve most severe censure.

Open-sight fire is justified and produces the desired results only when organized by well-informed commanders, and when fire is conducted by skilful hands. In every instance it is absolutely necessary to consider carefully all the factors which may in any way influence the effectiveness of this form of fire. All actions must be well considered and coordinated. The rich experience of battles must be studied and applied in practice when point-blank fire is employed. Let us see what this experience teaches.

Practical experience shows that during an attack, in preparation for an attack, or in counter-battery fire the emplacement of guns in open positions must be preceded by a detailed, carefully conducted reconnaissance of targets. In addition to this, the situation must be shown to each man concerned by study of the terrain. The gun positions and routes of approach to these positions must be prepared in secrecy. In designating targets and in organizing the sequence of fire one must not forget the fact that the guns may remain in their firing positions for a short time only, that the fire must begin at a signal common for the entire sector, while the batteries emplaced in concealed positions must, in the meanwhile, conduct counter-battery fire against the enemy mortars and artillery. All this assures, first, the element of surprise in the conduct of point-blank fire, and, second, the life of the guns engaged in its conduct.

As offensive combat progresses, various surprises arise. The attackers frequently encounter still-active centers of enemy resistance, and counterattacks. Not all the artillery by far is capable of aiding the infantry and tanks in such instances. This task must fall to the accompanying guns. These guns must ever be in full readiness; they must quickly prepare for fire, thus clearing the way for the advancing forces.

This type of fire is immensely important during defensive combat, when the enemy undertakes massed tank blows and engages large forces in assault on narrow sectors of the front. Combat experience bears witness to the fact that not only tank-destroyer elements but the entire artillery guns of all calibers must be prepared to strike the enemy from open positions. Such readiness must be expressed, before all, in measures for organizing all-around defense for every gun, in thorough study of the terrain, and in ever-vigilant observation of all approaches to their positions. Vigilance and effective defensive measures constitute the surest guarantee against a sudden enemy attack. And the more time, even in minutes, granted to the gun crews to prepare for fire, the more effective will the fire be. Well-organized, accurate, intensive point-blank fire will accomplish its task of defending the gun positions and will deny passage to any enemy vehicle or infantry.

The advantage of point-blank fire is in the fact that the pointer actually sees his target and can correct his fire without delay. In point-blank fire, which as a rule is conducted at short distances, the result is less affected by dispersion or atmospheric conditions. Commanders engaged in preparing for combat, and in training artillery personnel, are obliged to give sufficient time to the study of this effective method of destroying the enemy. Every Soviet artilleryman must be a master of point-blank fire and must strive to secure infantry protection for his gun in order to assure his own steadiness in combat.

The Struggle for Kharkov and the Dnieper, February-March 1943

[Translated and digested at the Command and General Staff School, Fort Leavenworth, Kansas, from a German article by Hermann Pirich, Elite Guard Reporter, in *Die Wehrmacht* 28 April 1943.]

OF ALL the operations in the winter of 1942-1943 over the vast area from the Caucasus to Leningrad, those in the Kharkov-Dniepropetrovsk sector are among the most important; for the successful struggle in this sector stopped the westward advance of the Soviets and prevented them from reaching one of their principal objectives, the Dnieper River. The recapture of Kharkov after it had been taken by the enemy marked the turning point in the winter operations.

Before our positions in Kharkov on 14 February 1943 stood an enemy with at least eight times our strength (see Figure 1). Over the surrounding area the Soviet flood was pouring in wild waves. The city had been by-passed to the north and south and our

FIGURE 1.
THE SITUATION ON 14 AND 15 FEBRUARY 1943.

supply routes and virtually all our connections with the rear were cut off. The next day the Soviet hordes broke into the city from the northwest and from the southeast, at the points where our defenses were relatively weak.

After such a change in the situation, should the Elite Guard try to hold Kharkov any longer? Not unless it desired to sacrifice the principal strength of its organization—its mobility! The command, therefore, decided to withdraw from the city by the highway leading to Krasnograd by way of Merefa.

The enemy was determined to reach the Dnieper at any cost, and south of Kharkov powerful wedges were driven through our lines as the Popoff Soviet Army Group and strong portions of the First and Sixth Armies plunged forward in the direction of Dniepropetrovsk and Pavlograd. For the Soviets the moment appeared more favorable than ever before. Their horse-drawn sleds and ox-teams, convoyed by dense masses of tanks, paid no attention to roads and highways but pushed directly across open fields as they drove desperately toward the Dnieper.

In order to stop this advance, our forces, from their defensive position in the Krasnograd area, struck hard in several directions. The operations that followed may be divided into four phases, indicated on the map (Figure 2) by the letters "A," "B," "C," and "D."

First, certain of our forces moved south to head off the Soviet spearheads advancing toward the Dnieper. With the help of the Elite Guard Tank Grenadier Division known as "Das Reich" and the "Deathshead" Tank Grenadier Division, German formations blocked the advance at Novomoskovsk. Then, executing a broad curve to the east and a swing to the north, they closed a circle around the advanced enemy combat forces (see Figure 2, "A," "A," "A," "A."), thus diminishing the momentum of enemy thrusts in this area.

Meanwhile, the "Adolf Hitler Bodyguard" of the Elite Guard had contributed to slowing down the enemy's movements by hastening at top speed from the Krasnograd area toward the east and plunging again and again into the initial assembly areas of the Soviet forces. Other grenadier divisions of the Elite Guard moved out in a broad curve to the east from Pereshchepino, and by hard, fast action joined in the northward movement that was to encircle the enemy in the second phase of the operations before Paraskoveya ("B" in Figure 2).

The encirclement at Paraskoveya was complete and entirely successful. Again there appeared the racing columns of horse-drawn vehicles and ox-teams flanked by tanks, but this time they were going in the other direction. They were in full flight, but wherever they appeared they were caught by the fire of our tanks and assault guns. Thus an enemy force consisting of the larger part of two Soviet armies, far superior to our forces so far as numbers of men and tanks were concerned, fell victims to a single armored corps of the Elite Guard whose flanks were well covered by army forces. Two Soviet armored corps and three infantry divisions met their fate in the encirclement at Paraskoveya.

The mad race to the Dnieper was ended, but the enemy was still in and around Kharkov. Although he had been able to withdraw only small portions of his defeated armies to this point, he had already brought up considerable forces of reserves.

Then another big encirclement began, the encirclement of Kharkov ("C" in Figure 2). From the defense area above Krasnograd the "Bodyguard" attacked the city on the west and northwest while other Elite Guard formations attacked on the south. Still another, moving up by way of Valki, Olkhany, and Dergachi, came down upon Kharkov from the north, blocked the highway to Belgorod, and then, curving in to the southeast, cut off the enemy's last route of retreat, the road to Chuguyev on the Donets River. Here, by 13 March, we had established ourselves firmly on the highway.

The fate of the enemy in Kharkov was sealed. On the evening of 14 March the enemy group in the area, along with the last reserves which were defending themselves in the Kharkov Tractor Works, were finally defeated and the city was again in German hands.

The first phase of the operations had stopped the enemy's advance toward the Dnieper in the vicinity of Novomoskovsk and Pavlograd, the second had encircled and destroyed his forces at Paraskoveya, the third had resulted in the recapture of Kharkov, and

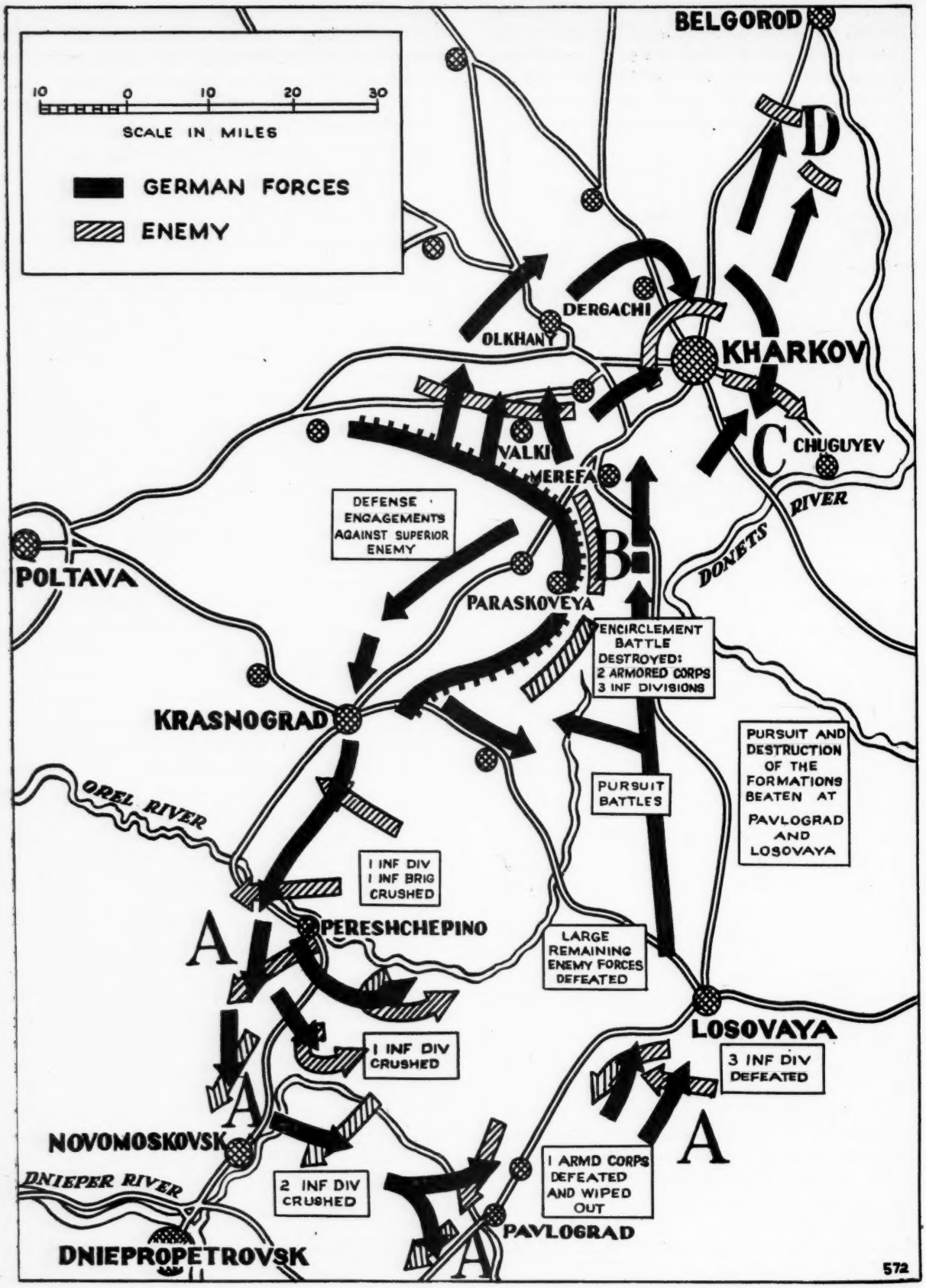


FIGURE 2.
OPERATIONS BETWEEN KHARKOV AND THE DNIEPER, FEBRUARY-MARCH 1943.

there was still to follow a fourth phase ("D" in Figure 2) which will not be dealt with here. It consisted of the concluding battles in the north and the thrust on Belgorod.

An order issued by the headquarters of the Third Soviet Armored Army fell into our hands and is given below. It is interesting to note that the order is dated 13 March when German forces were already on the Kharkov-Chuguyev highway in the rear of the Soviets. The places mentioned in the order are all in the immediate vicinity of Kharkov, southeast of the city. The 104th and 350th Infantry Divisions mentioned in Section 6 as reserves for the defense of the city were the last to resist, defending themselves in the Kharkov Tractor Works. What makes this order especially interesting is the importance which the Soviets attached to the holding of Kharkov although on 13 March, the date of the order, the offensive power of their forces was already entirely broken.

Series "G"
Headquarters, 3d Armored Army
Kamennaya Yaruga, 13 March 1943
Map 1:100,000—1941

To the
Commander of the 303d Inf. Div.
and the 195th Armored Brigade
Operations Order No. 150

1. The enemy is continuing his stubborn attacks on Kharkov. Small groups of tanks and infantry are occupying Sorokovka and the Rogany farm.

2. The 3d Armored Army has the assignment of defending Kharkov stubbornly. The divisions of the left wing of the army have the assignment of occupying the defense positions on the east bank of the Udy River with the boundary Kharkov-Borovoye by 14 March 1943 at 0400, and of holding this line.

3. The 17th Brigade of Interior Department Troops and the 179th Independent Armored Brigade have the assignment of defending the city of Kharkov stubbornly on the following line: 1st Battalion of the 17th Brigade of the Interior Department Troops occupies a position 2 kilometers southwest of Point 193.5 (which is situated 1 kilometer north of the Brashniki farm) while the other battalions in closest cooperation with the 179th Independent Armored Brigade defend the above-mentioned lines.

Command Post: Kharkov Tractor Works.

. One Regiment of the 19th Infantry Division on the line Brashniki farm-Nemyshlya, cooperating with the 86th Independent Armored Brigade, stubbornly defends the city of Kharkov with its other positions on the above line

Command Post: Nemyshlya.

. The 303d Infantry Division and the 195th Armored Brigade have up to 14 March 1943 at 0400 to occupy the defensive position on the east bank of the Udy River on the line Nemyshlya farm-Osnova-Elisarovka-Shichary-Bezlyudovka railway station, and to hold it.

Command Post: Southwest entrance to Osnova.

6. The 62d Guard Infantry Division and the 97th Independent Armored Brigade have until 14 March 1943 at 0400 to occupy the position on the east bank of the Udy River on the line, exclusive of Bezlyudovka, the north edge of Bezlyudovka-Visichevo-Temnovka, and to hold it.

Command Post: East entrance to Bezlyudovka.

The 104th Infantry Brigade and the 350th Infantry Division, as reserves for the defense of Kharkov, have until morning 14 March to take their position in the Kharkov Tractor Works.

7. Headquarters of the Army, Kamennaya Yaruga.

The next Command Post in Malinovka.

8. Reports to be sent periodically, at least every two hours.

Commander of the 3d Armored Army:
Lt. Gen. Rybalko

Member of the War Council of the Soviet Union:
Maj. Gen. Melnikov

Chief of Staff of the 3d Armored Army:
Maj. Gen. of the Guard, Armored Force,
Bakhmetyev.

"Nerves" in War

[An article by Norman Smart in *Britain* (British Information Services, New York), October 1943. Reprinted from the *Daily Express*, London.]

PSYCHIATRISTS who have watched and guarded the mental state of the Eighth Army are now in a position to take stock of their work. Perhaps the most important thing they have discovered is that when the soldier is properly trained, adequately armed, and competently led, when he believes in his cause and has good cover from the air, he does not, except in rare cases, suffer what used to be known as shell-shock. Perhaps it is better to say he does not suffer from the nervous disorders caused through the noise, excitement, and strain of fighting.

"Shell-shock" is a stupid term carried over from the last war, which presupposes that shock is a necessary accompaniment to battle.

In the last war shell-shock became as fashionable as appendicitis was in the early part of the century. Any nervous disorders from which a man suffered through exhaustion, lack of training, lack of faith, lack of leadership, lack of equipment, or worries loaded on his back in letters from home, were lumped together and called shell-shock. Now it is known that fit men initiated into battle through proper training are not shocked by shells.

Medical awareness of this has been growing since the beginning of this war. Fresh confirmation comes from figures produced by Army psychiatrists in the Middle East, where the story of nervous casualties in the forces has been one of progressive diminution.

During the El Alamein battle last October, when the Axis retreat began, there were only fifty-two cases of nervous disorders per thousand men reported in the Middle East Forces. In November, while we were pursuing Rommel, there was a slight rise to .57 cases per thousand men. In December it slumped to .29 cases per thousand men. The figures are, of course, those of a victorious army. That means an army which is complete and efficient.

I cannot give figures comparable with those for previous years, but here is one fair comparison. In the year 1941-42, ten to fifteen percent of men admitted to base hospitals from Red Cross convoys were nervous cases. Over a comparable recent period the percentage was two.

Noise or fear will not explain this difference in figures. What, then, is the cause? The answer of psychiatrists is that men in the earlier period were not so well trained, not so well equipped, and did not have adequate air cover.

When a soldier goes into battle and finds that the enemy is better trained, has better equipment, and has air cover which is lacking on his side, his confidence suffers and seeds of nervous disorders may be germinated. Then the strain and noise of warfare provide a fertile soil for these seeds, but they do not initiate them in properly trained and equipped soldiers.

When Montgomery's men went into the El Alamein attack, they knew they were prepared for it. They knew they had the guns, supplies, and airplanes, and "Monty" himself propped them up with his own cocksureness. After that there was no holding them. By beating the Germans there they increased their own mental stature tenfold, and trampled the seeding ground of fear. They were good and they knew it.

From my own experiences in the Western Desert, Tripolitania, and Tunisia I would say that the one thing above all others which helped to keep these men happy in their minds was the knowledge that they had some protection against air attack. Nothing is more devastating to morale and nerves as persistent bombing and strafing, with the consequent loss of sleep.

By rigorous self-discipline it is possible to overcome this fear to some extent. But you cannot do without sleep if you would remain an efficient soldier. The Germans, good psychologists, know this. When they lost air superiority, and their Stukas were falling from the skies, they continued the night nuisance raider. This was a plane which flew back and forth over our lines at night at four hundred feet or lower, taking two hours to drop a handful of bombs. When it had been droning about for an hour one wished for a radio set to beg the pilot to drop his load and go.

The small number of Eighth Army men affected by this kind of nervous warfare overhead and on the ground were not, as one might expect, infantrymen. They come lowest on the list. Heading the list of those suffering from battle neurosis are men not actively engaged in the fighting. There are all kinds of contributory causes for their vulnerability. For example, motor drivers work very long hours, and when they are attacked they cannot hit back.

Being able to hit back is a vaccine for warding off nervous troubles. Perhaps it explains why the infantryman comes lowest on this list. Also, infantrymen are very highly trained, grade one, seasoned troops, usually too busy to think about anything except their own job.

Men in tanks are fairly vulnerable, their nervous disabilities being precipitated by exhaustion. They have to operate their tanks, fight them, and service them. Fighting in a closed tank, with the noise of the engine drowning all else, is the most exhausting job of this war.

Army psychiatrists are explaining nervous problems, too, by inquiring into the soldier's way of living and his background before the war. The man who led a dull peacetime life wandering from job to job with no ambition, the man who was content with periods on "the dole," the man who made an unsuccessful marriage—these are types who may be liable to nervous disorders arising from battle experience. Men in dull, insecure jobs leading drab lives, are similarly vulnerable. Their jobs have not offered much opportunity for self-assertion or self-expression. They may be well trained, but when the testing time comes in battle, a few of them may prove irresolute and unable to discipline their feelings.

How is all the accumulated information on this subject being used? Each man entering the Army is graded mentally as well as physically. This ensures that the dull man is not given work outside his mental powers, which may cause him strain and nervous worry. Once a man has become a trained soldier he is initiated into the job under shellfire in battle schools. But that is not enough. There is no experience like the real thing. He has to be initiated as far as possible under enemy fire.

The few men who do suffer from battle neurosis caused directly through the effect of battle on their nerves or indirectly through physical exhaustion are treated in various ways. The most interesting treatment is continued narcosis. Patients are put to sleep for ten or twelve days, being awakened only for food and toilet. They sleep on the floor, because it has been found that in their sleep they may fall from their beds. Long sleep acts as a buffer between them and their battle experiences, and they awake refreshed and normal.

Men suffering from nervous confusion through exhaustion are evacuated to a quiet place as soon as possible. There they sleep under sedatives, and afterwards live in an unhurried atmosphere until they are fit again.

After really bad nervous cases have undergone treatment—they have become what soldiers call "bomb happy"—they are tested for their reactions to battle noises. This is done in a darkened room. A gramophone record of diving airplanes, exploding bombs, artillery and machine-gun fire is put on. The noise is amplified many times. The man is told exactly what is going to happen before he goes into the room. If he can stand the noise, he is fit. If he dives beneath the nearest piece of furniture, he goes back for more treatment.

Patients undergo treatment in hospitals run on strict military lines. They are kept usefully occupied, and, curiously, they prefer aggressive sports and games. This is generally because they have a sad sense of failure and are anxious to prove themselves whole men and return to their units.

That is the psychiatrist's job. He rebuilds their sense of worth, which they have temporarily lost.

The Russian Air Force

[Translated at the Command and General Staff School, Fort Leavenworth, Kansas, from a Spanish article by Captain R. S. Beltran, pilot, Mexican Army, in *Defensa* (Mexico) 28 May 1943.]

VARIOUS military writers have stated repeatedly that Russia has the best cooperating air force of all powers. Analysis of the German-Soviet war shows the correctness of this opinion. Careful study of the situation and of the combat air forces of Russia's future allies and existing enemy permitted the Soviet High Command to mobilize her air industries in a manner befitting the type of warfare with which she would be confronted. At the end of 1940 the general situation with respect to the war could be summarized as follows: Germany occupied the north central parts of Europe while her diplomacy was reaching out toward the southeast, making alliances with the Balkan countries and threatening the rear guard of Greece and the Russian flank.

England was recovering from the destructive German aerial offensive which ended in October and was beginning her retaliatory night air attacks.

Counting with certainty on one ally who possessed a powerful heavy air force (England), and on a potential ally whose heavy air force was being created at a rapid pace (the United States), the Soviet High Command conceived a plan of development and air activity which could be summarized in the following premises:

(a) Renounce the thought of long-range offensive aviation and limit herself to a reduced nucleus for the purpose of threatening Japan from Vladivostok and Spaask and for sporadic operations toward the west.

(b) Concentrate on direct support types in Soviet aviation production, including assault and dive bombers, and antitank and low-altitude pursuit planes. The work of aerial reconnaissance would remain in charge of combat aircraft, bombing, and pursuit planes, and liaison and artillery observation missions would be in charge of very small, low-cost planes which would be easy to replace.

(c) Construct a sufficient number of long-range interceptors and pursuit planes with high ceiling to take care of day and night air defense.

(d) Provide Soviet naval forces with the necessary equipment for reconnaissance, offense, and defense within a limited operational plan embracing the waters of the Arctic, the Black Sea, and the Sea of Japan.

(e) Leave to the Anglo-American air forces the task of carrying the war into German territory, the seat of the enemy's air industries and military production in general.

Having readjusted its air production a short time before the violent German attack, the aerial science of the Soviet Union carried out its task in an effective manner. It delivered to the fighting fronts planes of excellent cooperative characteristics, and put out during the first year of the struggle the "Voloyiki" as a dive bomber, the "Bombovoz" and the "Katiushka" as assault bombers, and the I-17 and I-12 as short- and long-range pursuit planes respectively.

In accordance with a definite objective, *cooperation with the army*, in 1942 the Muscovite air industry designed a plane which was a technical surprise to the enemy. This was the "Stormovik," the antitank plane. Its method of attack is at an angle; its weapons are two 32-mm cannon and a bomb which is rocket-driven. Another light bomber, the "Iliushin" has proved a dangerous adversary for the Nazi troops.

In defense of Stalingrad strong formations of formidable interceptors made their appearance. Such were the MIG-3 (I-18) and the I-6 pursuit planes, armed with machine guns and cannon to take care of the requirements of aerial combat and at the same time to attack light-armored enemy elements in low-level flight.

In 1942, there disappeared completely the R-2's, former observation planes, to make way for the reconnaissance planes, YAK-4 (BB-22) and the PE-2, both of them powerfully armed for defense and constructed for the double mission of bombing and reconnaissance.

Although Russian fliers have carried out some long range attacks with their T-B-3 and T-B-6 bombers against Bucharest, Ploesti, Danzig, and the rail-

way centers of eastern Poland, such attacks have not been continuous but have been merely aerial incursions, forming no part of an offensive of any considerable magnitude. They were simply isolated feints for psychological ends, complementary to the English air offensive.

Another of the aspects of the Russian objective of cooperation between the air and ground forces has been the indoctrination of these forces with the idea of mutual support. Her best known military writers, Grendal, Ziavoliki, and Shevchenko, have taken on themselves the task of propagating these ideas in the ground and air forces by means of constant writing on the subject of air-ground action.

The plan has been carried out in a masterly way. Russian aeronautical engineers study assiduously the characteristics of the support aviation of their allies. In substantiation of this stands the fact that the Soviets immediately discovered the great possibilities of the American light bomber, the Douglas A-20, which turned out to be a decisive element in opposing the Stukas in the last campaigns in Egypt, Cyrenaica, Tripolitania, and Tunisia. Beginning with 1941, the Russians ordered the A-20 and the Airacobra from the United States, the Blenheim and the Hurricane from the English.

Summarizing, the Russians have not failed to recognize the importance of aerial warfare, for we must remember that they have taken into account the doctrines of war and the possibilities of England and the United States. They limited themselves to the fulfilling of their task of stopping the armored armies of the Third Reich at any cost by means of the combined employment of their aviation, their powerful artillery, and all the methods and weapons of their ground forces.

Russian aviation was obliged, over a period of two years, to absorb all the punishment that the concentrated air power of Germany was able to inflict on it. Wise air strategy oriented the aeronautical industry and the organization and training of the Russian air forces, and conferred on them a leading mission alongside the army. In spite of its great initial losses in surprise operations by Göring's combat forces and the previous loss of important air bases and costly elements of maintenance as Smolensk, Kiev, and Poltava, and in spite of the abandonment of important industrial centers such as Taganrog, Kharkov, and Novorossisk, the Muscovite military aviation, a cooperative force *par excellence*, was able to get back on its feet, to appear incessantly on the field of battle, and to defend with determination its great industrial centers, its cities and communication networks.

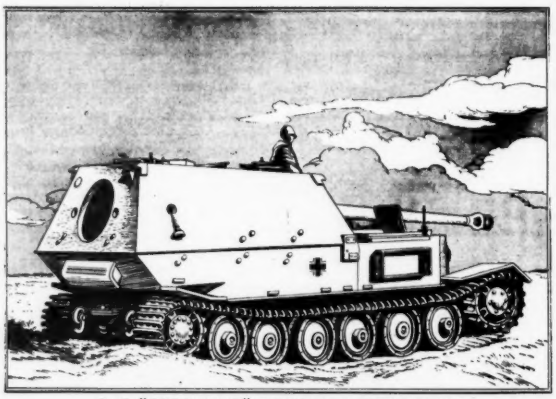
There is no doubt that the Red Air Force has contributed brilliant pages to the history of World War II.

Fighting the "Tiger" and "Ferdinand"

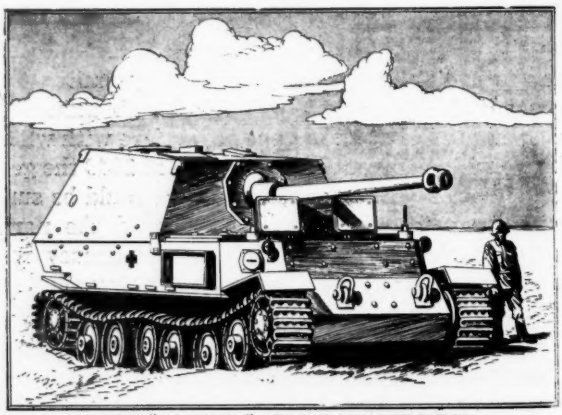
[Translated at the Command and General Staff School, Fort Leavenworth, Kansas, from a Russian article by Lieutenant Colonel L. Vysckoostrovski, Soviet Army, in *Krasnaya Zvezda* 24 July 1943.]

THE BACKBONE of the combat formations of German tank columns this year has been the new heavy tank T-VI, the "Tiger," and the armored self-propelled gun, "Ferdinand." The "Tiger" is a 60-ton vehicle with heavy frontal armor and powerful armament.

According to the Germans' intention, it was to play the role of a battering ram, invulnerable to the fire of our artillery and able to clear the way for all the rest of the matériel. To the self-propelled "Ferdinand" gun, having a weight of 70 tons and still stronger armor, the enemy entrusted fulfilment of those same plans. The "Ferdinand" in external appearance is little different from a tank. At the start of the battles many of our officers mistook it for the "Tiger." But the "Ferdinand" has comparatively low speed, is unwieldy in size, and has as armament only one gun, which is not mounted in a revolving turret. Though similar to a tank and moving with tanks, it is really a new variety of German self-propelled artillery. This is indicated by the enemy's tactical employment of these weapons and also by



THE "FERDINAND" (SIDE AND REAR VIEW)



THE "FERDINAND" (FRONT AND SIDE VIEW)

evidence furnished by crews of captured "Ferdinands."

Experience in the Orel-Kursk area has shown that both the "T-VI" and the "Ferdinand" are quite vulnerable. The heavy tank is more easily penetrated by the shells of our artillery, while the self-propelled gun-tank is less so. But on the other hand, the "Ferdinand" blazes up when a shell strikes its side armor next to the fuel tanks. The armor is not always penetrated, but the fuel catches fire very often. Whatever the differences in toughness between the German heavy tank and the heavy tank-gun, the means of combatting them are the same.

In one battle the enemy came down on our position with three hundred tanks, among which were up to 50 "Tigers" and "Ferdinands." Twelve of our self-propelled guns were disposed in concealment in rear of the defense. While the battle went on in forward positions, our self-propelled guns did not disclose themselves in any way. About twenty enemy heavy tanks, four "Ferdinands," and several medium tanks broke through. Then our self-propelled guns entered the battle. They moved out of earth fortifications in order to fire point-blank, and, remaining camouflaged, were disposed in the threatened direction to meet the enemy with surprise fire.

Fire on the German tanks began at a distance of 500 meters and less. At the hottest moment of the battle the range was 250 to 300 meters. Our artillerymen concentrated their fire on the "Tigers" and "Ferdinands," and direct hits occurred at the first shots. At a distance of 500 meters the T-VI tanks received great holes in turrets and side walls. When they approached to 300 meters and nearer, their front armor cracked, and if a heavy shell at this distance hit the turret, the turret was carried off entirely. A side blow from the burst of a heavy shell almost tore the hostile machine in halves, treads and all other running gear along with the rest.

It was somewhat more complicated with the "Ferdinand." The armor of these machines was more solid, especially in front, but treads, wheels, and undergear were destroyed with the same success; and the side and turret armor was found vulnerable. A large part of the German self-propelled guns blazed up upon shell impact near the gasoline tanks, even if the armor remained whole.

In this battle German armor suffered a severe blow. Gunners of self-propelled guns smashed and destroyed seven "Tigers" and four "Ferdinands," suffering no loss of their own. Having forced the enemy to defend himself, our self-propelled artillery regrouped and then came down on the Germans from a new direction not expected by them. In all, our self-propelled artillery annihilated thirty heavy hostile machines in the first battle.

This example and many other similar ones show that self-propelled artillery of large calibers is the most effective means of fighting against heavy enemy vehicles protected by thick armor, but it is necessary to use these guns very skilfully. Practice shows that when fire is opened by self-propelled guns from long distances the effect is small. Besides this, the guns are prematurely revealed and at once draw on themselves the fire of hostile aircraft, artillery, and heavy mortars.

Heavily armored vehicles have also been fought by artillerymen. In this case ordinary guns of medium calibers took part in the battle, firing with both special and ordinary shells. Guns of each battery were disposed in a triangle at sufficient distance from one another.

Firing "by threes" proved itself especially effective in fighting against the "Ferdinand" whose turret does not turn. This hard-to-penetrate vehicle is dangerous because of its accurate fire. But as soon as it is caught in a triangle, the enemy resembles an animal brought to bay. It turns from side to side, now on one, now on another gun, but all the while receives hits on the sides, on the rear armor, and through the large opening in the back. It should be stated that the gun crew in whose direction the "Ferdinand" is turned for the moment does not fire, thus remaining unnoticed. But as soon as the "Ferdinand" changes direction, the gun again comes to life and continues to hammer the enemy.

Such method of fighting heavy enemy tanks finds wide use; batteries armed with guns of various calibers take advantage of it. Born in the course of battles, this method requires exact fire cooperation not only among the three guns but also among neighbors adopting the same combat formation. It cannot always be foreseen which gun in which triangle will succeed; but one thing is clear: firing from two, three, or four directions on one most dangerous target will lead to its quick extinction. Practice has proved that if artillerymen are well teamed up they will be able during battle to maneuver fire quickly in order to silence the target without changing position. The commander must determine with which neighbor to cooperate, while all the rest depends on knowledge of conducting fire.

Among other methods of fighting against heavy German tanks, good results are obtained by various types of ambush, including that by tanks. Sudden point-blank fire (by any gun, light tank, etc.) may wreck a heavy vehicle if it is hit in the most vulnerable places. There were some cases when our light tanks, armed with 45-mm guns, successfully defeated "Tigers" with point-blank fire from ambush. These tanks hit the sides and optical apparatus of the "Tigers." Even our infantry set fire to a few of these vehicles with ordinary bottles of inflammable liquid. Antitank mines, grenades, and bundles of ordinary grenades are also able to smash the tread of the heavy tank and damage its running gear.

During the first days of the German attack our troops found the means of fighting "Tigers" and

"Ferdinands." Now the problem is to teach this combat experience to all the other units of the Soviet Army.

Turkey's Armed Forces

[Translated from a German article by Major General Rudolf Ritter van Zylander in *Neues Wiener Tagblatt* 13 August 1943.]

SINCE the beginning of the present war, the successful effort of the Turkish Government to maintain neutrality has caused a severe strain on her strength in every field, especially the military field. This country, on whose approximately 800,000 square kilometers of soil about 17 million inhabitants dwell, has, owing to the outcome of the First World War and the rebirth of the nation due to Ataturk, gifted creator of the New Turkey, become a nation in which the Kurka form the only considerable racial element except the Turks, who constitute 96% of the population. The people were therefore especially willing to increase the nation's defensive strength.

Little information concerning the development of the Army during recent years has naturally been given out. The number of active troop units has been increased and reserve units have been formed. According to information dating from the middle of 1942, thirteen army corps, comprising a total of thirty-two infantry, one armored, and one cavalry division, have been formed from the nine army corps corresponding to the various corps areas. The three Army Inspectorates also existing in time of peace have been converted into Army High Commands, and preparations for the creation of a fourth have been made. In accordance with the political situation prevailing at the time, two armies were stationed on the Straits and the Thracian Front, respectively, while the third was stationed between Trebizond and the Syrian frontier. We may assume that extensive shifts of troops will occur whenever there is a change in the political situation. The hasty completion of the railway and highway net, especially in the eastern and southeastern part of the country, on which large sums are being spent, also serve this purpose.

Troop units have the usual organization and composition. Heavy artillery is organized in corps and fortress regiments. AA artillery is attached to the Army. Infantry is equipped with 7.65-mm Mauser rifles, a part of which are made in Turkey, and with Hotchkiss and Maxim machine guns; the artillery comprises, in addition to older, light guns, a part of which have been provided with new and improved tubes, more modern Vickers and Skoda cannon. The heavy 150-mm field howitzers used by the corps artillery are drawn in two loads by horses, and have a range of fifteen kilometers. The mountain artillery is equipped with 75-mm Bofors and 105-mm light Skoda howitzers, which are transported in three parts, each drawn by two horses, and have a maximum range of nine kilometers. The AA artillery consists of light 20-mm guns, and of 75-mm Vickers cannon having a vertical range of 9,000 meters.

The Air Arm, whose strength before the present war amounted to only 8,500 men and 450 airplanes of all kinds, has since been considerably enlarged but is still far from having the strength called for by the program drawn up in 1937, namely, 1,000 combat planes and 15,000 airplane pilots. An "Aviation Society" is trying to bring about a better understanding of the Air Arm among the people, and the "Turkish Bird" youth organization is trying to give young men premilitary training in gliding and other subjects. Women are also entering the Air Arm but various circumstances prevent their numbers from increasing. Only two distant reconnaissance and fighter flights are stationed in Izmir, and the main part of the Air Arm is designed to support ground troops. There are three aviation regiments, each consisting of two fighter squadrons and one pursuit squadron, which, in turn, are composed of two or three flights. In the summer of 1942, nine airfields with improved runways had been completed, in addition to which there were four airports in Thrace and ten in Anatolia. The existing schools comprise an academy for officers, an aviation school, and a school for mechanics. As no domestic airplane industry yet exists, the material was composed of a collection of the most varied types of foreign planes. English, American, French, Polish, and German planes were represented. The Government is trying to remedy this state of affairs, and has decided to construct a plant for the production of motors. In June, 1942, a newly constructed airplane factory on the Bosporus demonstrated the first plane built in Turkey to the Ministers. An "Aerodynamic Institute" is now being organized. A Department for Aeronautic Engineers is to be created in the School for Engineers at Istanbul. The first public training exercise for parachutists, which was still on a very small scale, was held in Istanbul in the summer of 1942.

The Navy does not fulfill the requirements imposed upon it by the necessity of protecting the extensive coast line. The only large ship in the service is the very old armored cruiser, "Yavus," remodeled in 1930 (the former German "Goeben") and dating from the World War period, and the two small cruisers "Medjidje" and "Hammidje," of 3,300 and 3,800 tons respectively. According to the "1943 Nauticus," two other small cruisers are under construction. Italy and England are to deliver several new destroyers: Italy had already delivered four of them and was building four more before the war. Nothing has been heard about the delivery of the four destroyers ordered in England. Turkey had

nine submarines before the war, and had ordered four more in England, which must now be in use. The "1943 Nauticus" calculates that the Turkish Navy consists of forty-nine completed units (mostly small) totaling 62,537 tons. The merchant fleet, which comprises only about 180,000 tons, can contribute little to the Navy's strength.

Since the Treaty of Montreux was signed, Turkey has constructed new fortifications on the Straits and has also recently completed the Chatalja Line, protecting Istanbul on the side toward the Balkan Peninsula.

Turkish Armed Forces will form a valuable addition when Turkey is allied with a great Power. All the strong points of the Turkish soldiers can then be utilized. At all events, Turkey has repeatedly been ardently wooed by our enemies. During the negotiations conducted with England and France early in the war, both these countries sought to exploit the military weakness of Turkey by putting the delivery of equipment and armament in first place and making political demands in return. England alone subsequently continued to do this. Turkey naturally took advantage of the opportunity to fill the gaps in her armament and equipment. Turkey concluded a Treaty of Amity with Germany on June 19, 1941. Her foreign policy is based on the idea of remaining completely independent of all other nations. The Government knew that Turkey must rely on her own strength in order to maintain her independence and is therefore trying to increase the strength of her Armed Forces.

Clearing Road Blocks Under Fire

[Translated at the Command and General Staff School, Fort Leavenworth, Kansas, from a Russian article by Major G. Menshikov, Soviet Army, in *Krasnaya Zvezda* 27 August 1943.]

PRESSING the enemy to the west, our forces have reached the Bryansk forests. Wooded and swampy terrain, absence of roads, stubborn resistance of the Germans, lines of engineer-constructed obstacles which the enemy puts up everywhere along the route of our advance—all these greatly complicate the struggle.

On the Karachev-Bryansk highway the enemy is blowing up bridges and placing mines to block probable by-passes, which are very few in this swampy terrain. In clearing a route to by-pass a bridge, our sappers, as a rule, extract 150 to 200 anti-infantry mines.

In order to prevent movement and to render difficult the restoration of the road, the Germans methodically rake the highway with artillery and mortar fire, doing this around the clock. They construct road blocks every kilometer, tieing up felled trees with wire and mining them. In the majority of cases the road blocks are covered by automatic-rifle fire. The brooks and streams which cross the highway are used by the Germans for the organization of intermediate defensive positions. They strive thus to stop the attackers at natural obstacles in order to protect the retreat of their rear units and to cover the activity of their engineer elements engaged in the methodical destruction of the roads.

Experience of the initial battles in the Bryansk forests testifies to the fact that in offensive operations the correctly organized and well prepared combat activity of obstacle-clearing details assumes great importance. In the "X" unit the obstacle-clearing details consist of automatic riflemen, reconnaissance personnel, and sappers with mortars and individual guns, the latter being predominantly light. The combat formation of the obstacle-clearing detail is arranged in the following manner: reconnaissance personnel moves in front, followed by automatic riflemen and sappers and finally by the mortars and the direct-support gun. When encountering the enemy the detail engages him in combat, while the reconnaissance personnel and automatic riflemen proceed to search for routes whereby the enemy flanks and rear may be reached. The mortars and the gun fire on the road block most of the time. In reaching the road block the sappers begin to open it and clear it of mines, being protected in this work by mortar and automatic-rifle fire.

While moving along a highway in a westerly direction, one such obstacle-clearing detail emerging from a village encountered a road block erected by the Germans in a place which was difficult to by-pass. Noticing our reconnaissance, the enemy opened heavy machine-gun and rifle fire along the road. Our mortars answered with intensive fire and, at the same time, our reconnaissance people and automatic riflemen, who were making their way through an exceptionally difficult terrain, by-passed the obstacle on the left. As soon as the Germans sensed the danger of encirclement they speedily retreated. As our sappers began to clear the road block the Germans attempted to interfere by means of machine-gun fire, also unsuccessfully. Two enemy machine guns and their personnel were destroyed by our mortar and gun fire. The by-passing moves of our automatic riflemen continued and the enemy was again compelled to retreat.

This and other similar experiences lead to the following conclusion: when encountering the enemy protected by obstacles it is necessary to by-pass them, using small groups of automatic riflemen who should make a quick search for convenient by-passes, overcoming all difficulties. Of course, efforts should be made to keep the by-passing movements unknown to the enemy. It is very important that the heavy weapons supporting the obstacle-clearing detail keep the enemy pinned down by their fire, deflecting his attention from his flanks. Under such conditions frontal

attacks are of little use, for they involve excessive losses and may bring about the slackening of the tempo of advance. Had the obstacle-clearing detail mentioned above attacked frontally instead of by-passing the road block, the course of the battle would have been entirely different. In such a case the Germans would have made efforts to take advantage of their favorable position which allowed them to keep the highway under their fire. It is easy to guess that in this situation a frontal attack would have caused unavoidable losses in personnel, while in executing the by-passing operation the detail suffered no losses at all and the Germans left fourteen of their dead.

If the obstacle-clearing detail encounters a position of greater strength organized by the Germans for a long defense, then the mission of the detail is to engage the enemy in order thus to disclose the nature of his defense and the disposition of his weapons and personnel. At the same time, the reconnaissance personnel should make every effort to find possibilities for by-passing the enemy positions in order to strike his flanks and rear with the main elements of the advancing infantry.

Thus, the fundamental method of action by obstacle-clearing details, which are indispensable under conditions of wooded, swampy terrain, lies in energetic by-passing of defending enemy groups, and in sudden, swift blows on the most vulnerable places of enemy defense. Therefore, the obstacle-clearing detail should not be overloaded with heavy weapons. Inasmuch as artillery's maneuverability is extremely limited by the nature of the terrain, it will act either by individual guns, or by a concentrated fire on the enemy firing positions and personnel along the main axis of the attack.

Bomber Self-Defense

[An article in *The Aeroplane* (Great Britain) 23 July 1943.]

A YEAR AGO the first of the Fortresses in the European forces of the U.S.A. were preparing to make their assaults on targets in enemy hands. Their crews, and the crews of the many other Fortresses which have since joined in the attack, have acquired a high degree of experience during that year. Among other things they have learned how to arrange their formations in a vertical as well as a horizontal "V" to ensure the most effective concentration of fire against enemy fighters. Those fighters, too, have learned a little wisdom. They attack almost invariably from the front, preferring the hazard of the two hand operated guns in the nose of the Fortress to the heavier fire they would have to meet on the beam or astern.

In other words, the Fortresses have reduced the enemy's fighter attacks to snap-shooting. The period of each attack is short, and as the two aircraft approach each other at a combined speed of 550 miles per hour the shooting has got to be good. The fighter's aim, indeed, needs to be exceedingly good, because it fires as it rolls over defensively to present only its armored belly to the Fortress's bullets at close quarters. No bomber could be treated with greater respect, and the Fortress can justly claim to have proved the British case for defensive armament more convincingly than the British. The strength of the Americans lies in their 0.5-inch machine gun.

Nevertheless, the British belief in turrets is powerfully reinforced by this Fortress terror acknowledged in the tactics of the German fighters. For the moment the R.A.F is committed to speed as the means of defending the day bomber against fighter attack. That policy solves the problem of range in relation to ammunition. It avoids the dilemma of having potential range, which cannot be used over enemy territory because ammunition would probably be exhausted before the fighting was done. But it does not solve the question of delivering big bomb loads by day. Heavy daylight raids may have to be undertaken again by British bombers. If that need should arise, the experience of the Fortress crews should be of great value.

Turrets can give a large measure of immunity if they are well armed. Now that the Germans are putting the main weight of their aircraft production into fighters, the turret assumes a fresh importance. Night bombers are likely to meet more fighter opposition. Heavy defensive fire will tend to become a necessity to them. Happily the relations between Bomber Command of the R.A.F. and Bomber Command of the U. S. Army Eighth Air Force are intimate and cordial. The lessons the Fortresses have learned are at the disposal of the Lancasters and Halifaxes. The British, as the pioneers and inventors of turrets, will surely not miss the chance to make their bombers still more formidable. And we will gladly offer our thanks to those Fortress crews who showed us what a little more weight and a little more range in turret armament might mean.

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